AVIATION MEDICINE

AN ANNOTATED BIBLIOGRAPHY

1952 LITERATURE

by

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and

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Technical Information Division

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PREFACE

This volume is the first annual cumulation of the bibliography of Aviation Medicine prepared under Government Order NAonr-211-56 by members of the Bibliography Section of the Technical Information Division in the Library of Congress. The task was initiated by the Bureau of Medicine and Surgery and the Office of Naval Research because of the growing interest in aviation medicine since World War II and the lack of an adequate comprehensive compilation on the subject since the publication of Hoff and Fulton's extensive Bibliography of Aviation Medicine.[1]

Scope

In subject coverage and scope this bibliography conforms with H. G. Armstrong's Principles and Practices of Aviation Medicine.[2] Present plans are to include all available published book and periodical literature and unclassified reports issued since 1951. Eventually, it may be possible to bridge the gap between Hoff and Fulton's compilation and the present undertaking. Every effort is being made to include all literature of direct interest and applicability to aviation-medical research, but to exclude all other material. Thus, articles on equipment and machinery have been disregarded unless some physiological or psychological relationship to the pilot, crew members, or other aviation personnel could be established. Papers on basic research, entirely general in nature, as a rule have been omitted; those of specific application have been included. For example, some general papers on visual perception and on physiological effects of noise are regarded as applicable to the study although they do not deal specifically with aviation activities. The bibliography is unrestricted with regard to languages, but it should be noted that, because of limitations in personnel, no Slavic or other languages in non-Roman alphabets have been included in this first cumulation. An expansion into at least some of these languages is, however, anticipated in future volumes.

Arrangement

The bibliography is arranged alphabetically by first author and by year of publication, the latter being printed in the upper right corner of each entry in the same line as the author's name, using letter suffixes (e.g., 1952a, 1952b) to designate further publications during the same year by the same author. This author-date-letter combination is used in the indexes to identify each reference. The names of co-authors, interspersed in the main body of the bibliography at their respective alphabetical locations, refer the reader to the first author under which the item is abstracted.

Form of Entries

The material included may be divided into three major categories: (1) journals, (2) books, and (3) reports, and the entries are arranged respectively as follows:

(1) Journals: Author(s), title of paper, name of journal, volume, issue number in parenthesis, pagination, and date. English translations of foreign-language titles are indicated by brackets and precede the original language titles. The frequently occurring elements of English journal titles have been abbreviated (see Journal Title Abbreviations, page v). The names of foreign-language journals are given in full, followed by the place of publication. The code letters at the end of the citation indicate the library where the journal was consulted, using the symbols of the National Union Catalog (see page v). The given library's call number for the publication has been added if available.

(2) Books (monographs): Author(s), title, edition, pagination, place of publication, publisher, and date. The location of the book consulted in a library is indicated by code letters (see page v) at the end of the citation, followed by the call number for the given library.

(3) Reports: Personal author(s), title of report, organization producing the report (corporate author), project or contract number, issuing government agency if other than the corporate author, report number, date, and pagination. For further identification and as an indication of availability, control numbers (AD, TIP, etc., see page iv) have been added. Finally, the security classification "Unclassified" has been indicated for all defense-related reports still bearing this classification.

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[1] Hoff, E. C. and J. F. Fulton. A Bibliography of Aviation Medicine. Springfield, Ill., and Baltimore, 1942. Supplement, by P. M. Hoff, E. C. Hoff, and J. F. Fulton, Washington, 1944.

[2] 3rd ed. Baltimore: Williams and Wilkins, 1954.

Type of Abstracts

The abstracts presented in this bibliography are informative to the extent of supplying concise data as to purpose, scope, experimental methods employed, results, and conclusions reached by the author. Whenever possible, the authors' own abstracts or summaries have been used, either in their original form or modified. Likewise, abstracts previously prepared for AD or TIP cards have been used whenever deemed adequate. In all cases where such abstracts have been utilized, original authorship is indicated at the end of the abstract.

Indexes

Alphabetical corporate author and subject indexes have been provided. References are identified by author, year, and letter suffix (see under Arrangement). In the corporate author index, subordinate agencies are listed under higher ranking organizations; thus the Directorate of Flight Safety will be found under U.S. Air Force. In the subject index, the main headings (in capital letters) are subdivided into subordinate divisions (effects, relations, etc.). As a rule, the subject headings are uninverted. Cross references are provided to direct the reader from the higher categories to more specific headings ("see also" references) and from terms not used in the index to pertinent synonym headings ("see" references).

Availability of Materials

Many of the periodicals and books cited herein are located also in libraries other than those at which the references were consulted. Government-sponsored reports are in general more difficult to locate, but copies of some reports listed in this volume may be obtained from the issuing agencies. References bearing a PB number may be purchased from the Office of Technical Services. Members and contractors of the Department of Defense may borrow reports from the established document centers under the usual conditions applicable to unclassified reports produced by or for military agencies. The principal accession or control numbers, which indicate the location of the report in these collections, or other availability, are:

AD ASTIA Document; available at the ASTIA (Armed Services Technical Information Agency) Document Service Center, Knott Building, Dayton 2, Ohio; or ASTIA Reference Center, Library of Congress, Washington 25, D. C.

TIP Technical Information Pilot; available at the ASTIA Reference Center, Library of Congress, Washington 25, D. C.

ATI Air Technical Index; available at the ASTIA Document Service Center, Knott Building, Dayton 2, Ohio.

PB Publication Board; for sale by the Office of Technical Services, Department of Commerce, Washington 25, D. C.

For those reports listed herein without control numbers, it is suggested that inquiry be made of the Bibliography Section, Technical Information Division, Library of Congress, Washington 25, D. C., for further information.

Acknowledgements

The bibliography on aviation medicine is being compiled under the guidance of an informal committee made up of representatives of those American and Canadian government agencies primarily interested in aviation medicine. The compilers are grateful to the members of this committee for their interest, advice, and assistance during the course of the task, particularly to Capt. T. Ferwerda and Capt. N. C. Barr of the Bureau of Medicine and Surgery, Mr. J. H. Heald of the Office of Naval Research, and Wing Comdr. R. H. Lowry of the Royal Canadian Air Force. Acknowledgements are due the staffs of various libraries in the Washington area, including the National Library of Medicine, and the libraries of the Bureau of Aeronautics, the U. S. Army, the Civil Aeronautics Administration, the Bureau of Medicine and Surgery, the Office of Technical Services, and the National Advisory Committee for Aeronautics, for helpful cooperation in finding material. The authors wish to express their indebtedness to Dr. Roman Kenk, Supervisor of the Biological Sciences Unit, Bibliography Section, under whose helpful direction this bibliography has developed from the planning stage to its present form. A special note of appreciation is due to fellow members of the staff of the Bibliography Section for valuable assistance in carrying out the work, particularly Mrs. Mabel L. Nall for aid in editing and subject indexing and Mrs. Mabel H. Duffner for advice on citing corporate authors. Finally, thanks are also due to the Publication Section for excellent work in publishing this volume.

Journal Title Abbreviations

The abbreviations used herein for journal titles are intended to save space without sacrificing ready recognition. Minor words such as articles and prepositions, and occasionally parts of long titles have been omitted, and the words and names occurring most frequently in titles are abbreviated. The following is a key to the title word abbreviations used:

Acad.	Academy
Acoust.	Acoustic
Aeronaut.	Aeronautical
Amer.	America(n)
Arch.	Archives
Assoc.	Association
Bacteriol.	Bacteriology
Brit.	British
Bull.	Bulletin
Canad.	Canadian
Coll.	College
Compar.	Comparative
Corp.	Corporation
Dept.	Department
Dermatol.	Dermatology
Div.	Division
Elec.	Electrical
Endocrinol.	Endocrinology
Eng.	Engineering
Exper.	Experimental
Gaz.	Gazette
Gynecol.	Gynecology
Hyg.	Hygiene
Inc.	Incorporated
Indus.	Industrial
Inst.	Institute
Jour.	Journal
Lab(s).	Laboratory(-ies)
Laryngol.	Laryngology
Mag.	Magazine
Med.	Medicine, Medical
Nat.	National
Ophthalmol.	Ophthalmology
Otol.	Otology
Otolaryngol.	Otolaryngology
Pathol.	Pathology
Physiol.	Physiology
Proc.	Proceedings
Psychol.	Psychology
Quart.	Quarterly
Rev.	Review
Sci.	Science
Scient.	Scientific
Soc.	Society
Surg.	Surgery
Tech.	Technical
Univ.	University

Library Symbols

DAL	U.S. Army Library, Pentagon Building, Washington, D. C.
DC	U.S. Department of Commerce Library, Washington, D. C.
DCAA	U.S. Department of Commerce, Civil Aeronautics Administration Library, Washington, D.C.
DCAB	Civil Aeronautics Board Library, Washington, D.C.
DH	U.S. National Institutes of Health Library, Bethesda, Md.
DLC	U.S. Library of Congress, Washington, D. C.
DN-Aer	U.S. Department of the Navy, Bureau of Aeronautics Library, Washington, D. C.
DN-Med	U.S. Department of the Navy, Bureau of Medicine and Surgery Library, Washington, D.C.
DNAC	U.S. National Advisory Committee for Aeronautics Library, Washington, D.C.
DSG	U.S. National Library of Medicine (formerly, Library of the Surgeon General of the Army)
DSI	Smithsonian Institution Library, Washington, D.C.
NNE	Engineering Societies' Library, New York, N.Y.
NNSAE	Society of Automotive Engineers Library, New York, N.Y.

Errata

Page 18: The entry Bair, J. T., should read: Bair, J. T. see also Hollander, E. P., 1952, 1952a; Maag, C. H., 1952

Page 29: The entry Blair, J. T. should be deleted

Page 111: The entry Maag, C. H., 1952, should read: Maag, C. H., and J. T. Bair

Page 129: The entry Payne, B. A., 1952 should read: Payne, R. B., 1952a

BIBLIOGRAPHY

Anonymous 1952
[FIRST GENERAL ASSEMBLY OF THE ITALIAN ASSOCIATION OF AVIATION MEDICINE (A. I. M. A.), VENEZIA, MAY 29-30, 1952] Iª Assemblea Generale dell' Associazione Italiana di Medicina Aeronautica (A. I. M. A.), Venezia, 29-30 Maggio 1952. — Rivista di medicina aeronautica (Roma), 15 (2): 305-335. 1952. In Italian.
DLC (TL555. A1R5, v. 15)

This is an illustrated account of the first general assembly of the newly formed Italian Association of Aviation Medicine (Associazione Italiana di Medicina Aeronautica, or A. I. M. A.). This article contains no technical papers.

Anonymous 1952a
FLIGHT NURSE SCHOOL. — Amer. Jour. Nursing, 52 (7): 833. 1952. DLC (RT1. A5, v. 52)

The curriculum of a course in aeromedical nursing, offered at Gunter Air Force Base in Montgomery, Alabama, is briefly outlined. The course includes instruction in aviation physiology, the use of oxygen during flight, and first-aid practices specifically related to airplane accidents. The nurses receive orientation in the characteristics of various types of planes used for evacuation and are trained in the use of life preservers and other rescue equipment. The course is divided into lectures, the showing of training films, field trips to various air bases, and extensive practice in actual flight.

Anonymous 1952aa
CIVIL AVIATION MEDICAL RESEARCH IS LAGGING. — Jour. Aviation Med., 23 (3): 209-210. 1952. DSG

The Civil Aeronautics Act of 1938 does not provide satisfactorily for an authority charged with the task of providing adequate physical standards and specifications for aircraft in terms of human engineering. In the interest of national security it is recommended that the aviation medical program keep pace with the rapid progress of civil aeronautical engineering and with the operational development.

Anonymous 1952ab
MOTION SICKNESS. — Brit. Med. Jour. (London), 2: 553-554. Sept. 6, 1952. DSG

A review of recent studies on motion sickness prevention reveals that 0.6-1.0 mg. of hyoscine (scopolamine) is the most effective preventive, quickly acting, and suitable also for treatment. However, owing to its side effects, it should not be given over periods longer than 48 hours on prolonged journeys.

Anonymous 1952ac
AVIATION MEDICINE. — U. S. Air Force, Air Forces in Europe, Office of the Air Surgeon, Comments for Medical Service Personnel (Wiesbaden), no. 9: 8-9. 1952.
DSG (W2 A4A14c, no. 9)

Air evacuation patients should be properly classified as to sickness and type of transportation recommended. Many ambulatory ward patients are to be classified as litter patients when transported by air. Medical personnel at the air bases should be trained for immediate readiness in case of emergencies.

Anonymous 1952ad
INSTITUTE OF CIVIL AVIATION MEDICINE PROPOSED. — Jour. Amer. Med. Assoc., 149 (1): 78. May 3, 1952.

Foundation of an Institute of Civil Aviation Medicine was proposed by the Aero Medical Association. The Institute would fulfill the following principal functions: (1) it would serve as a focal point for civilian aviation medical activities; (2) it would promote training of resident medical examiners in better understanding of the psychological and physiological implications of flying; (3) it would provide for adequate field instruction of Civil Aeronautics Administration medical examiners; (4) it would develop preventive medical techniques and apply them to flying; and (5) it would create adequate civilian research facilities.

Anonymous 1952ae
FLYING DOCTORS. — Jour. Amer. Med. Assoc., 149 (4): 384. May 24, 1952. DSG

A basic course in aviation medicine, offered by the School of Aviation Medicine at Randolph Field, Texas, is limited to regular Air Force medical officers and to reserves who volunteer for 5 years. It consists of one year of study at Randolph Field, including 8 weeks of pilot training at Goodfellow Air Force Base (San Angelo, Texas), and is followed by one year of postgraduate work at a civilian medical college. After completion of the 2-year training course, 3 additional years in the field with Air Force units are required to attain eligibility for certification as an aviation medicine specialist.

Anonymous 1952af
HELICOPTER MEN WIN TROPHY. — Jour. Amer. Med. Assoc., 149 (4): 385. May 24, 1952. DSG

Helicopters of the Third Air Rescue unit of the U. S. Air Force's 67th Medical Group in Korea rescue downed pilots within minutes. Treatment is given on the homeward flight by an aeromedical specialist. Medical facilities are kept in readi-

ness at the base hospital. The complete "ambucopter" evacuation takes ordinarily not more than 40 minutes.

Anonymous 1952ag
FLYING AND HEART DISEASE. — Jour. Amer. Med. Assoc., 149 (7): 718. June 14, 1952. DSG

In reply to a query whether a 17-year-old boy suffering from rheumatic valvular heart disease (aortic insufficiency) and a blood pressure of 160/0 should be allowed to fly a Piper-Cub, the following facts are presented: the prognosis of aortic insufficiency is the worst of all valvular lesions, and sudden death is not uncommon. The hemodynamics necessary to maintain adequate cerebral circulation would be impaired in flight. For these reasons certification for flying is not advised.

Anonymous 1952ah
STUDY OF HUMAN ADAPTATION TO HIGH ALTITUDES. — Jour. Amer. Med. Assoc., 149 (13): 1236. July 26, 1952. DSG

A visit to the Institute of Andean Biology near Morococha, Peru, directed by Dr. Alberto Hurtado, is described [for details see: Anonymous, 1952q].

Anonymous 1952ai
FERTILITY IN MAN. — Jour. Amer. Med. Assoc., 149 (15): 1431. Aug. 9, 1952. DSG

In answer to a query it is stated that inhalation or ingestion of carbon tetrachloride (used in fire extinguishers) does not cause male sterility; no injurious effects on fertility could be attributed to high-altitude flying over long periods of time.

Anonymous 1952aj
ARTIFICIAL PNEUMOTHORAX AND FLYING. — Jour. Amer. Med. Assoc., 149 (17): 1611. Aug. 23, 1952. DSG

Commercial planes flying over the Rocky Mountains reach altitudes from 18,000 to 20,000 feet at a cabin pressurization of 6,000 to 8,000 feet. Patients with a pneumothorax of 50% of living volume are advised never to fly at such altitudes because of the rapidity of pressure changes. Hypoxia at 8000 feet reached by plane or train would not be significant in the case of 50% bilateral pneumothorax in a normal lung. But the danger of sudden accidental depressurization is constantly present and the effects would be very injurious.

Anonymous 1952ak
AIRLINE PLANS RESIDENCY IN AVIATION MEDICINE. — Jour. Amer. Med. Assoc., 150 (5): 499. Oct. 4, 1952. DSG

A residency to be established by American Airlines will offer postgraduate training to civilian physicians and flight surgeons in the following subjects and practices: care of flying personnel, selection and maintenance of crews, transportation of patients and ill passengers, aircraft accident management, safety and health programs, altitude indoctrination, sanitation, insurance and compensation problems, and airline medical administration.

Anonymous 1952al
ROCKET SENDS MAMMALS UP 200,000 FT. — Jour. Amer. Med. Assoc., 150 (9): 948. Nov. 1, 1952.

Monkeys and mice fired in a rocket to an altitude of about 200,000 feet returned unharmed to the ground. They withstood an initial acceleration of about 15 g lasting less than one second and a subsequent acceleration of 3-4 g, lasting 45 seconds. One mouse, placed in an empty container, appeared to have lost its sense of direction and orientation while floating in a gravityfree state. Another mouse, however, whose drum was provided with a shelf, was able to cling to it and command its body at will. The application to men of the findings from these animal experiments should be made with caution. Reports on pilot performance under subgravity conditions have indicated no adverse effects on the subjects' sense of orientation. [cf. Anonymous, 1952w]

Anonymous 1952am
HIGH OXYGEN ATMOSPHERES. — Jour. Amer. Med. Assoc., 150 (10): 1058, Nov. 8, 1952. DSG

An oxygen concentration up to 60% in air has no harmful effects to humans. For some persons, respiration of almost 100% oxygen produces vague substernal pain and upper respiratory tract irritation. People breathing high-oxygen atmospheres for a longer time may undergo physiological modifications, such as diminution in respiratory rate and volume.

Anonymous 1952an
HELICOPTER AMBULANCE UNITS. — Jour. Amer. Med. Assoc., 150 (15): 1503. Dec. 13, 1952. DSG

Helicopter ambulances established recently by the U. S. Army Medical Service will provide emergency service supplementing existing means of evacuation. They will include 5 two-rotor utility helicopters capable of carrying 3 litter patients or 4 ambulatory patients, together with a medical attendant and the pilot. Organizational and training aspects are summarized.

Anonymous 1952ao
COURSE IN AVIATION MEDICINE. — U. S. Navy Medical News Letter, 19 (2): 22. 1952. DSG (W1 UN598, v. 19)

The Bureau of Medicine and Surgery of the U. S. Navy announces a course in Aviation Medicine, which will be given at the U. S. Naval School of Aviation Medicine, Naval Air Station, Pensacola, Florida. It will consist of six weeks of academic instruction in aviation medicine and flight indoctrination training.

Anonymous 1952ap
PRESENT STATUS OF CERTIFICATION IN AVIATION MEDICINE. — U. S. Navy Medical News Letter, 19 (12): 22-24. 1952.
DSG (W1 UN598, v. 19)

At the request of the Interim Board on Aviation Medicine, and with the encouragement of the Advisory Board for Medical Specialties, the American Board of Preventive Medicine and Public Health has considered a combination of preventive medicine and aviation medicine to form a medical specialty. Under this new setup the American Board of Preventive Medicine and Public Health would become the American Board of Preventive Medicine, which would incorporate the appropriate professional organizations in aviation medicine among its sponsors. Standards for certification in aviation medicine under this newly created board would meet the basic standards established by the Advisory Board for Medical Specialties. These standards are enumerated and briefly outlined. — It was voted that the Advisory Board for Medical Specialties approve in principle the proposal, but that no certificate be issued until the number of acceptable training centers were increased (only 2 were available at the time of that resolution, both military), and until training requirements would be more specifically defined, and applicants would not be restricted to members of the Aero Medical Association.

Anonymous 1952aq
[AVIATION AND NAVAL MEDICINE COMMISSION: A PRESENTATION] Flyg- och navalmedicinska nämnden: en presentation. — Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 1952 (1): 2-3. 1952. In Swedish.
DSG

In April 1947, a Commission was established to plan and promote fundamental and experimental research in the field of aviation medicine, in collaboration with military and civilian aviation authorities. In June 1948, naval medical research was incorporated in the project, since many activities are common to both fields alike. Three laboratories are functioning under the Commission, affiliated with the following institutions: Lund University (Lund), Karolinska Institute (Stockholm), and Gymnastiska Central Institute (Stockholm).

Anonymous 1952ar
[VISUAL REQUIREMENTS IN AVIATION] Synskrav ved flyvning. — Nordisk medicin (Stockholm), 48 (48): 1655-1656. 1952. In Danish.
DSG

In conjunction with the showing of an American film on aviation medicine at the 71st meeting of the ophthalmological department of the National Hospital at Copenhagen (on February 13, 1948), the following points were discussed: (1) flyers should not be assigned to night flying duty after having been exposed to bright glare during daytime, unless protected by sunglasses; (2) night-vision tests are not satisfactory yet; greater emphasis should be placed on testing the ability of contrast discrimination in dim light rather than night vision as such; (3) a distinction should be made between relative and absolute depth perception, and tests of depth perception should be carried out over a number of days; and (4) the qualifications of pilots should not be based on single criteria, such as intelligence, physical strength, health, character, etc., but on a combination of all factors. Reference was made to problems concerning color vision, binocular vision, and various methods of testing pilot vision.

Anonymous 1952as
[THE PILOTS OF JET PLANES SEIZED BY AN EPIDEMIC: THE "JET JITTERS"] Les pilots d'avions à réaction attaints par une épidémie: les "Jet-Jitters". — Paris-Press, 1952 (May 13): 5D. 1952. In French. DLC

Emotional disturbances and psychoses due to the piloting of jet planes have assumed major proportions in a number of countries where jet aviation is progressing. This is exemplified by the following statistics: In the U. S., 55% of all West Point graduates chose to join the Air Force in 1922, against 45% in 1942, and 24% in 1952. Cases of experienced, war-decorated pilots suddenly refusing to fly any further are increasing alarmingly. From Australia it is reported that flight pilots at the Korean front were on the verge of collapse after 3 months of service. In France, great difficulties have developed in recruiting jet-fighter pilots, and a reduction of flying time in jet planes to 60 hours per year had to be effected to alleviate the situation. In Great Britain, R. A. F. pilots are reported to have refused to fly jet planes, and a great percentage of cardio-vascular disorders is to be attributed to pure psychological causes. A survey undertaken in an American fighter-pilot training school revealed that Turkish, Spanish, and Asiatic aviator candidates seem to be less prone to succumb to the "jet-jitters".

Anonymous 1952at
WORLD'S LARGEST CENTRIFUGE TESTS MEN AND EQUIPMENT. — Tele-Tech, 11 (July): 42-43. 1952. DLC (TK161. A1T4, v. 11)

The Naval Air Development Center at Johnsville, Pa., constructed the largest centrifuge for the purpose of testing how humans and communication and electronic equipment react to accelerations encountered in supersonic flight. The test subject is enclosed in a gimbal-mounted gondola and may be accelerated to 40 g (to a speed of 180 m. p. h. at 48. 6 r. p. m.) in 6. 8 seconds. A television camera, equipment for taking X-ray motion pictures, and for registering respiration, heart rate, blood pressure, and heart and brain waves are incorporated in the gondola.

Anonymous 1952au
PRONE POSITION. — U. S. Air Force Medical Service Digest, 3 (1): 26-27. 1952.
DSG (W2 A403u, v. 3)

A study of visual problems related to prone position in flight is outlined, undertaken by the School of Aviation Medicine at Randolph Field, Texas (Project 21-24-011). Subjects were instructed to sight a target for the duration of one hour from a prone-position bed, with their heads fixed at 15, 20, 25, and 30° angles. A tendency of the eyes to deviate to a measurable degree when the head was elevated 15°, was observed, accompanied by a sensation of discomfort. Some subjects experienced double or blurred vision, a disturbance which was alleviated by looking downward. A second group of subjects was tested to determine the range of side vision during elevation of the eyes. Lateral vision at elevated angles was limited due to the obstructive effect of the nose or eyebrows. The advisability of optical aids (mirrors, prisms, etc.) to substitute for elevated gaze is pointed out. For effective vision, pilots should limit their gaze to 20°.

Anonymous 1952av

ARCTIC TRAINING. — U. S. Air Force Medical Service Digest, 3 (1): 27-28. 1952.
DSG (W2 A403u, v. 3)

Student flight surgeons of the School of Aviation Medicine, Randolph Field, Texas, participated in a practice maneuver which took place at the Arctic weather hangar at Eglin Base, Florida. 24 subjects were exposed to an artificial blizzard for 12 hours. Simulated rescue and survival techniques (construction of makeshift shelters from parachutes and random pieces of drift wood, selection of proper protective clothing, etc.) were practiced.

Anonymous 1952aw

DITCHING EXERCISE. — U. S. Air Force Medical Service Digest, 3 (1): 29, 31. 1952.
DSG (W2 A403u, v. 3)

A simulated ditching operation involving a plane carrying "patients" was performed, as part of a course in rescue and survival, given to flight nurses at Gunter Branch. The patients were transferred on litters from the sinking "plane" to an inflated rubber life raft. Prior to this exercise the flight nurses had undergone 18 hours of swimming instruction, had attended a 3-hour course on the use of survival equipment, and had seen a training film on abandoning a sinking plane.

Anonymous 1952ax

NEW ADJUSTABLE LITTER ASSEMBLY. — U. S. Air Force Medical Service Digest, 3 (3): 12-13. 1952. DSG (W2 A403u, v. 3)

A new arrangement in planes for the evacuation of patients is described, designed by the Brown-Line Corp., Beverly Hills, California, and tested by the Engineering Division, at the Wright Air Development Center, Ohio. The litters are arranged in vertical order, removed from the curved walls of the fuselage, thus allowing for more head room and better ventilation and being less subject to vibration. The litters are held in place by nylon straps provided with metal brackets. This new arrangement has been successfully used on C-54 planes, flying patients between Travis Air Force Base, California, and Andrews Air Force Base, Maryland.

Anonymous 1952ay

CARBON TETRACHLORIDE. — U. S. Air Force Medical Service Digest, 3 (4): 10. 1952.
DSG (W2 A403u, v. 3)

Carbon tetrachloride is potentially toxic after inhalation, contact with the skin or mucous membranes, or oral ingestion. Poisoning may result from a single brief exposure to a high vapor concentration or from repeated exposures to lower concentrations. The maximum safe amount of carbon tetrachloride vapor in the air is 50 parts per million (or 0.005% by volume). Such a concentration is produced by the evaporation of only 5.5 ml. of the solvent into a room 100 feet square and 10 feet high. Two case histories of carbon tetrachloride poisoning are reported and Air Force regulations curbing the use of the substance are cited.

Anonymous 1952az

THE PROBLEM OF NOISE. — U. S. Air Force Medical Service Digest, 3 (5): 8-9. 1952.
DSG (W2 A403u, v. 3)

The noise of a propeller-driven plane consists of two components: (1) a low-frequency (75-150 cps), low-intensity, discontinuous, harmonic-line spectrum produced by engine, propeller, and exhaust, and (2) a continuous band spectrum produced by the slipstream. The first of the two components exceeds the second in intensity and determines the overall noise level. The noise of a jet plane approaches true white noise, i.e., both the engine and the slipstream portion display a continuous spectrum over a wide frequency range, the lower frequencies (200-1500 cps) having the highest intensity levels. The jet compressor acts like a siren, producing high-intensity vibrations up to 5000 cps. The extent of hearing damage is determined by the intensity and frequency distribution of the noise and by the length of exposure to noise, as well as by individual predisposition. Intensities below 85 decibels are considered safe below 10,000 cps, in case of continuous exposure. The extent of hearing impairment is proportional to the length of exposure, with hearing losses occurring in the frequency ranges of the damaging sounds. Permanent losses from exposure to airplane noises tend to occur in the 2,896, 4,096, and 5,792 cps regions in susceptible subjects.

Anonymous 1952b

FRENCH FLY JETS FROM "ARMCHAIR". — Aviation Week, 56 (2): 33. Jan. 14, 1952.
DLC (TL501.A8, v. 56)

Elimination of the cumbersome control stick in favor of a chair handle arrangement forms the basis of an invention by the French engineer and

test pilot Jacques Lecarme of the SNCASE (Société Nationale de Constructions Aéronautiques du Sud-Est). The system has been employed successfully in an SE 2410 Grognard, a twin-jet fighter prototype. Clear view of the instrument panel, fatigue reduction resulting from the upholstered armrest and seat, and clearance of the cockpit of the encumbrance of the stick are cited among the principal advantages. Tests showed, however, that armchair controls are better suited for transport planes and bombers than they are for fighters where pilots tend to react naturally and more quickly with a wheel.

Anonymous 1952ba
MEDICAL EXAMINATIONS AND CLASSIFICATION. — U. S. Air Force Medical Service Digest, 3 (5): 9, 12. 1952. DSG (W2 A403u, v. 3)

Methods, practices, and scope of a medical "Aircrew Effectiveness Program" are briefly outlined. The importance of a thorough first examination of flying candidates and of continuing medical observation during and after flight training is stressed. To relieve the burden of the flight surgeon, cases involving flying personnel only should be referred to aviation medicine specialists.

Anonymous 1952bb
AVIATION MEDICINE. — U. S. Air Force Medical Service Digest, 3 (5): 11-13. 1952. DSG (W2 A403u, v. 3)

Physical standards for the selection of flyers should apply to all types of planes and operations rather than being limited to any particular specialty (such as "pilot only"). Defects of coronary circulation, anemia, unexplained loss of consciousness, convulsive disorders, and diseases requiring maintenance therapy demand automatic disqualification from flying, while orthopedic disorders, or defective sight or hearing should be evaluated under actual flying conditions. The role of the civilian consultant in aviation medicine is discussed and the primary objectives of aviation medicine are listed.

Anonymous 1952bc
THE FLIGHT SURGEON. — U. S. Air Force Medical Service Digest, 3 (5): 25. 1952. DSG (W2 A403u, v. 3)

The basic qualifications and duties of the flight surgeon are reviewed.

Anonymous 1952bd
HOW MUCH IS GREATER FLIGHT SAFETY WORTH? — Amer. Aviation, 15 (46): 30-31. 1952. DLC (TL501. A675, v. 15)

The lack of progress in aviation safety research is deplored by the author. Areas of improvement in this field are suggested: functionalization of the cockpit as contrasted with standardization; measurement of fatigue or alertness by the recording of brain waves or by determination of the frequency threshold at which the eye perceives continuous light from a flickering source; the effect of combination of stresses on the human body (fatigue, high g loads, and hypoxia combined could lead to collapse, although these stresses individually are within "safe" limits).

Anonymous 1952be
RED BETTER THAN YELLOW FOR AIR SEA RESCUE GEAR. — Science News Letter, 62 (8): 121. 1952. DLC (Q1. S76, v. 62)

The original color choice for air-sea rescue equipment was a bright yellow. This has been changed to a bright scarlet because it was observed that yellow life rafts were found to blend with the bright reflection of the sun on water.

Anonymous 1952bf
FOOD FOR FLYING. — Flying Safety, 8 (7): 14-15. 1952. DNACA

A special pilot mess has been established at Nellis Air Force Base, Nevada, in which diets are prepared with particular consideration to flying needs (non-gas forming, well-digestible food, sufficient supply of salt, etc.). The importance of regular eating habits is stressed. Response on the part of the aviators to the "training table" was highly favorable.

Anonymous 1952bg
THE PILOT ON INSTRUMENTS. — Flying Safety, 8 (3): 22-23. 1952. DNACA

Tests undertaken on a large group of pilots to determine pilot error due to sensory illusions and vestibular disturbances revealed, among others, the following facts: 39% of the group erred when attempting to judge whether a plane was climbing, level, or diving; 37% misjudged the position of the plane (whether banked to the right or left, or level); and when the climb-dive and bank judgments were made together, 60% of the group were wrong. Instrument proficiency is an indispensable requirement for safe flying, and the old "fly by the seat of the pants" concept is entirely outdated in modern aviation. The paper presents a percentage breakdown of erroneous instrument interpretations, as compiled from accident analyses. Ways of improving instruments and instrument arrangement are indicated.

Anonymous 1952bh
THE G VERSUS YOU AND YOUR AIRPLANE. — Flying Safety, 8 (3): 18-20. 1952. DNACA

The physiological and psychological effects of ultrasonic speeds and high g forces on the pilot are briefly reviewed. The study is primarily concerned with structural and resistance factors of the airplane.

Anonymous 1952bi
CAA WARNS PILOTS ON USING HIGH DOSAGES OF AMPHETAMINE. — CAA Jour., 13 (6): 64. 1952. DCAA

Warnings were issued separately by the Civil Aeronautics Administration (U. S. Department of Commerce) and by the Director of Air Services of Canada, that pilots should not use amphetamine or its derivatives for reducing purposes, following two recent fatal accidents in England involving pilots who had taken Dexedrine to lose weight. Even taken in small doses, the drugs increase excitability and anxiety and may lead to improper reactions in situations of stress.

Anonymous 1952bj
HUMAN CENTRIFUGE. — Aircraft (Toronto), 14 (8): 15-16. 1952. DCAA

A brief pictorial description of the centrifuge at the Naval Medical Acceleration Laboratory at Johnsville, Pa., is presented. The centrifuge is powered by a huge General Electric vertical motor, capable of developing a maximum of 16,000 hp (the normal rating being 4,000 hp). It can be accelerated from 0 to 90 m.p.h. in 1 1/2 seconds, and from 0 to 173 m.p.h., in less than 7 seconds. Animal experiments (with chimpanzees) involving forces as high as 15 g are planned, as well as tests of various types of equipment. The test subject is placed in a gondola shaped like an oblate spheroid (10 x 15 ft.), whose inner and outer shells are aluminum with a middle layer of light-weight cellular material called "strux"; the gondola can be depressurized to the equivalent of 60,000 ft. altitude. Instruments, including high-speed television, X-ray, and motion picture cameras, are mounted inside. The gondola, which is attached to a 50-ft. rotating arm and suspended on double gimbals, can be tipped and somersaulted in any desired direction while the centrifuge is in motion. The centrifuge is housed in a reinforced concrete and steel building, 130 ft. in diameter.

Anonymous 1952bk
SAFETY IN AIR TRANSPORTATION. — Interavia (Geneva), 7 (4): 183. 1952. In English. DCAA

Comparative statistics are presented of major accidents in 1951, involving airplanes as well as other means of transportation (ships, busses, railroads, etc.). The figures reveal comparatively low accident rates for commercial airplanes, thus refuting the distorted ideas on the subject of air travel brought about by overemphasis of aviation accidents by the press.

Anonymous 1952bl
FEAR OF FLYING—BY WHOM? — USAF Personnel Newsletter, 5 (7): 1-3. 1952.

The allegation, frequently expressed in public, that recent cases of pilots refusing to fly because of suddenly developed anxieties is an indication of moral and psychological deterioration of the younger generation, is refuted in broad and general terms. It is noteworthy that the drop in applications for aviation training, which coincided with the above phenomenon (beginning of 1952) ended abruptly by May of the same year. A valid explanation of this temporary slackening of the recruiting program has not yet been found.

Anonymous 1952bm
POSSIBLE PHYSIOLOGICAL AND PSYCHOLOGICAL EFFECTS OF HIGH INTENSITY NOISE ASSOCIATED WITH JET AIRCRAFT ENGINES WITH AFTERBURNERS. — U. S. Navy Medical News Letter, Aviation Supplement, 12 (3): 1-5. 1952. DSG

Ultrasonic vibrations are tolerated relatively well by humans because of the high reflecting power of the skin (in contrast to furred animals, which absorb up to 12% of high-frequency sound energy converting it into heat). Of greater importance than the frequency scale, with regard to physiological effects, is the intensity of sounds. For airborne sound, the threshold of nonauditory perception is about 120 decibels. At this intensity level a vibration of the cranial bones, the nasal passages, and the bony sinuses is perceived in the 1500 - 700 cps range; in some instances, blurring of vision has been reported. At lower frequencies, a vibratory sensation is felt in the chest and in the muscles of the arms and legs. Persons standing near the exhaust stream of a J-33-9 turbo-jet engine showed neuromuscular symptoms (general weakening) and experienced a sensation of heating of the skin (principally in the 4,000-10,000 cps range). The lower frequencies of jet noise tend to have the highest intensity levels. Temporary hearing losses of 25 decibels were suffered after 3 1/4-minute exposures to J-33-9 engine noise at close range, and 10-minute exposures at distances of 10-12 ft caused hearing losses of 68 decibels. Introduction of afterburners has greatly increased noise hazards. Studies on afterburner noise damage are under way.

Anonymous 1952bn
OUR AGING PILOTS. — Jour. Aviation Med., 23 (6): 545-546. 1952. DLC(TL555.A1A4, v. 23)

A small but consistent overall increase in the percentage of pilots over fifty years of age has been observed since 1949, with the greater proportion in the private pilot groups (as compared to commercial and transport pilots). This editorial article stresses the need for the development of methods of detecting physical deterioration due to age at an early stage and of predicting significant failure before it occurs (particularly in the cardiovascular system). The current emphasis on general gerontological studies, and on psychological and psychiatric investigations of skills and mental capabilities in relation to aging are steps in the right direction. The Aeromedical Association should take the lead in the promotion of such a research program.

Anonymous 1952bo
REPORT OF THE PRESIDENT'S AIRPORT COMMISSION. — Jour. Aviation Med., 23 (4): 309-310. 1952. DLC (TL555.A1A4, v. 23)

The Airport Commission of the President of the U. S. has designated the Aero Medical Association to sponsor a thorough study of pilot aging and allied problems and to re-evaluate the physical standards for licensing of civilian pilots in the light of technical advances in modern aviation. In this connection it is suggested that representative medical schools throughout the country establish graduate and undergraduate courses in aviation medicine.

Anonymous 1952bp
FITTING MACHINES TO MEN. — Product Engineering, 23 (3): 164-167. 1952. NNE

In order to design airplane cockpits in conformity with normal human abilities and limitations, the designer should base himself on a so-called activity analysis, i. e., a detailed study of operator functions in relation to equipment. Preliminary experimental studies regarding temperature, humidity, lighting conditions, and noise should be undertaken, and mechanical factors should be investigated (e.g., dial indicators, machine controls, machine dimensions, selector switches, machine mountings, etc.). Visual indicators require particular study. Extremely fine dial subdivisions should be avoided. Pointers moving in clockwise direction are preferable to counters. Scale units should be numbered in multiples of 5, 10, and 100. In designing controls, the magnitude and type of potential load, the accessibility, and the sensitivity to control motion should be taken into consideration.

Anonymous 1952bq
WORLD'S MOST POWERFUL CENTRIFUGE STUDIES HUMAN TOLERANCE TO ACCELERATION. — Product Engineering, 23 (8): 188-189. 1952. NNE

A pictorial description is presented of the operation and design of the human centrifuge at the Naval Aviation Medical Acceleration Laboratory at Johnsville, Pa. The photos show (1) the overall design of the centrifuge; (2) the control mechanism located in the observation "blister" above the centrifuge; (3) the centrifuge arm and gondola; and (4) the interior of the gondola housing the test subject.

Anonymous 1952br
PILOT SURVIVAL. — Naval Aviation News, 1952 (3): 1-7. DN-Aer

This is an illustrated summary of survival training, tactics, and equipment. The curricula of the Nome (Alaska), Great Falls (Montana), and Camp Carson (Colorado) survival schools are outlined. Survival tactics are reviewed, such as rescue at sea, survival in the arctic, etc. Items of equipment are described, such as life rafts, escape capsules, oximeters, exposure suits, survival kits, etc. Training procedures with simulated ejection seats, "Dilbert Dunkers", and parachute towers are described.

Anonymous 1952bs
BAROTRAUMA. — Lancet (London), 1952, vol. 2 (6741): 926. Nov. 8, 1952. DSG

Otitic barotrauma occurs when a pressure difference exists between the middle ear and the surrounding atmosphere. To equalize the pressure, the tensor muscles of the palate must contract to allow air to enter the tympanic cavity (by swallowing or yawning). At a certain point muscular action is no longer effective, and the symptoms produced may be severe (deafness, tinnitus, pain, and vertigo). The tympanic membrane is drawn in and may be congested to the point of rupture; in severe cases, congestion, interstitial hemorrhage, even actual rupture of the membrane may occur. Effusions of clear fluid or blood into the middle ear may give the appearance of bubbles or of a blue bulging drumhead. Hypertrophy of the lymphoid tissue in the tube is an additional symptom. Dental barotrauma usually occurs during ascent, and molars are particularly affected (pain is felt distinctly in recently filled teeth).

Anonymous 1952bt
A NEW NAVAL AVIATION SELECTION TEST BATTERY. — U. S. Navy Med. News Letter, 22 (4): 32-35. 1952. DSG (W1 UN598, v. 22)

The revised Aviation Selection Battery of the U. S. Navy consists of two parts. Part I, the Aviation Qualification Test (AQT), is primarily a general intelligence test; Part II, the Flight Aptitude Rating (FAR), includes three tests: the Mechanical Comprehension Test (MCT) and the Spatial Apperception Test (SAT) intend to predict the success of the individual in the flight phase of the training program; the Biographical Inventory (BI) analyses the patterns of response and motivational factors. The scores made on the three tests are combined to give the Flight Aptitude Rating. In the revised battery, candidates who fail the AQT test will not be given Part II. — Considering the high cost of training of naval aviators ($65,000 for complete training of an individual, and about $16,000 for a candidate accepted but later dropped out from training) it is suggested that in the examination of flight candidates the following sequence be observed: (1) color vision and visual acuity test; (2) selection test; and (3) complete flight-physical examination.

Anonymous 1952c
[THE ITALIAN ASSOCIATION OF AVIATION MEDICINE (A. I. M. A.)] L' Associazione Italiana di Medicina Aeronautica (A. I. M. A.). — Rivista di medicina aeronautica (Roma), 15 (2): 301-304. DLC (TL555. A1R5, v. 15)

An announcement of the foundation of the Italian Association of Aviation Medicine (Associazione Italiana di Medicina Aeronautica, or A. I. M. A.).

Anonymous 1952d
AF REVEALS HIGH-ALTITUDE PRESSURE SUITS. — Aviation Week. 57 (15): 17. 1952. DLC (TL501. A8, v. 57)

The T-1 high-altitude suit, designed by the Air Development Center at Wright-Patterson Air Force Base, Dayton, Ohio, combines altitude protection with anti-g suit features, and includes crash helmet, earphones, microphones, oxygen mask, goggles, defroster, and oxygen bailout bottle. It is inflated automatically if cabin pressurization is lost. 5 photographs in the text show the suit in operation.

Anonymous 1952e
CHUTE TESTING DUMMY. — Canad. Aviation, 25 (8): 62. 1952. DLC (TL501.C33, v. 25)

A dummy for testing parachutes, ejector seats, etc., developed by the GQ Parachute Co. Ltd. and constructed by the Hairlok Co. Ltd. of Great Britain is described. Its body dimensions are based on the average human weight, center of gravity, and moment of gyration about various axes of anatomical components (hand, forearm, upper arm, etc.). The dummy consists of a steel "skeleton" which supports rubberized hair material (called "Hairlok") covered with a canvas "skin" to give the dummy the correct external shape. Spring joints are incorporated to minimize the damage from excessive movements. The dummy may also be used as a test target or for any purpose when the employment of human beings would be hazardous.

Anonymous 1952f
NEW CAPSULE FOR HIGHSPEED BAILOUT. — Aviation Week, 57 (4): 36. July 28, 1952. DLC (TA501.A8, v. 57)

A new escape capsule developed by Douglas Aircraft Co. is discussed. The capsule is expelled clear of the speeding plane by a rocket charge and is stabilized in flight by three rear fins. Forward speed is first slowed by a small auxiliary chute decelerating from 1,100 to 300 feet per second in about 5 seconds, then, at a safe speed, the main chute opens. The capsule is sealed and pressurized for use in atmospheric conditions above 50,000 ft. Fresh air is fed in "by wave motion". Survival gear similar to that carried in Navy life rafts is supplied. A test run under simulated conditions was tolerated well and without discomfort by the test subject.

Anonymous 1952g
OPERATION LIFESAVER. — Air Force, 35 (6): 28-29. 1952. DLC (UG633.A65, v. 35)

The organization of air evacuation of casualties on the Korean front is briefly summarized. By keeping the "evacuation lifeline" in continuous flux, air transports have cleared as many as 1,800 patients a day from Korean hospitals to make room for new casualties.

Anonymous 1952h
PUTTING ON THE PRESSURE. — Boeing Mag., 22 (10): 12-13. 1952. DLC (TL724.5.B6B6, v. 22)

The "T-1" high-altitude suit devised by the United States Air Force is briefly described. Its basic parts are a coverall of green cloth edged with capstan tubes, an inner helmet of rubber, which permits pressurization of the helmet and lungs, and the external helmet with earphones and microphone and transparent faceplate. The suit begins to operate at an altitude of 47,000 feet.

Anonymous 1952i
A SELF-RELEASING SEAT-BELT. — Flight (London), 61: 767. June 27, 1952. DLC (TL501.F5, v. 61)

A coupling device for seat belts so designed as to open up automatically under excess g-loads (under crash conditions) is described. The inventor, Mr. J. R. Sturge Whiting of Great Britain, has applied for patent protection.

Anonymous 1952j
AIR RESCUE SERVICE COMMENDED. —Military Surgeon, 110 (2): 150. 1952. DLC (RD1.A7, v. 110)

The Air Rescue Service of the United States Air Force was commended for aid rendered during a yellow-fever epidemic in Costa Rica. A helicopter manned by six made 42 landings over an area of more than 6000 square miles, in 11 days. 37 villages and settlements were visited and 1000 persons inoculated. 200 additional persons in outlying districts were given medical treatment.

Anonymous 1952k
SPECIAL FLIGHT SURGEON INSTRUCTION. — Military Surgeon, 110 (4): 301-302. 1952 DLC (RD1.A7, v. 110)

A special training course is described, given to medical doctors who take up postgraduate studies at the U. S. Air Force School of Aviation Medicine. It includes week-long indoctrination at Camp Carson, Colorado (the Strategic Air Command's survival school), followed by a cold-weather training course in the Rocky Mountains near Colorado Springs. From there the students proceed to Wright-Patterson Air Force Base in Dayton, Ohio, where they spend two weeks, first in the Aero Medical Laboratory and then at Air Material Command headquarters.

Anonymous 1952l
SCOTTISH AIR AMBULANCE SERVICE. —Jour. Amer. Med. Assoc., 148 (16): 1441. Apr. 19, 1952. DLC (R15.A48, v. 148)

The air ambulance service on the Scottish islands, instituted by the Department of Health for Scotland in 1933 and developed extensively during the Second World War, is briefly described. After the war, it was taken over by the British European Airways. The service is available to any physician in outlying areas. Each plane is provided with a stretcher and accompanied by a nurse. In 1949, the busiest year on record, 72,000 miles were flown and 350 patients (surgical, accidents, and maternity) transported.

Anonymous 1952m
FOURTY-TWO UNITED STATES AIRLINES WIN '51 SAFETY AWARDS. — New York Times. June 27, 1952, p. 43 (col. 5). 1952.
DLC

In bestowing safety awards upon 42 U. S. domestic, territorial, and overseas airlines, the National Safety Council stated that the yearly accident rate of 1.3 deaths for each 100 million passenger miles (for domestic operation only) was not as good as the 1950 rate of 1.1, but still represented one of the best in aviation history. During 1951 there were 10 domestic accidents, in which 169 persons, including 27 crew members, lost their lives. Vice Admiral Emory S. Land, president of the Air Transport Association, pointed out that the percentage of fatal crashes in total daily operations amounted to as little as 0.0001%.

Anonymous 1952n
TOXICITY OF ROCKET PROPELLANTS. — Lancet (London), 1952, vol. 1 (24): 1294-1295. June 28, 1952. DLC (R31.L3, 1952, v. 1)

The toxic effects of hydrazine ($NH_2.NH_2$) are described. Reports from the German rocket launching station of Peenemünde indicate that workers exposed to hydrazine or its hydrate (the German rocket fuel contained 30% hydrazine, 57% methanol, and water) suffered from nausea, vomiting, dyspnea, and bradycardia; in severe cases the poisoning lead to coma and death. The symptoms are similar to those of ammonia poisoning. Dermatitis upon contact with hydrazine has also been reported. The substance has a corrosive effect on the mucous membranes of the nose and throat and causes pain and itching in the eyes, followed, after longer exposure, by edema of the eyelids and the conjunctiva. Recovery begins after the 3rd day and extends over a week.

Anonymous 1952o
MAXIM SILENCER FOR INSTALLED JET ENGINES. — Shell Aviation News, 1952 (169): 23. 1952. DLC (TL501.S55, v. 1952)

The Maxim Silencer Company of Hartford, Connecticut, has produced a device which reduces the noise level of turbojet engines from 165 to 135 decibels. Noises of 135 decibels can be withstood by the human ear protected with ear plugs or ear flaps, while noises beyond 150 decibels would cause permanent injury and even death. The construction of the Maxim Silencer is described and special engineering problems are discussed. The device is for ground use only to protect mechanics and personnel working in the vicinity of the running engine.

Anonymous 1952p
CENTRIFUGE SIMULATES JET ACCELERATIONS. — Machine Design, 24 (9): 142-144. 1952.
DLC (TJ1.M15, v. 24)

The human centrifuge at the Naval Air Development Center, Johnsville, Pennsylvania, is discussed in a popular manner. Photos and diagrams illustrate the text. (cf. Pierce, T. F., 1952.)

Anonymous 1952q
GENERAL BENSON TO PERUVIAN ANDES. — Military Surgeon, 111 (3): 211. 1952.
DLC (RD1.A7, v. 111)

A visit of General Otis O. Benson, Jr., commandant of the Air Force School of Aviation Medicine, Randolph Field, Texas, with a party of military and civilian scientists to the Institute of Andean Biology is reported. The Institute, which is under the direction of Dr. Alberto Hurtado, is located on the upper slopes of the Andes, near the mining town of Morococha, at an altitude of 14,900 feet. The local Indians, who work in the mines at an altitude of 18,000 feet, are the object of special studies.

Anonymous 1952r
THE HUMAN CENTRIFUGE. — Military Surgeon, 110 (5): 375. 1952. DLC (RD1.A7, v. 110)

The Human Centrifuge at the Acceleration Laboratory, Naval School of Aviation Medicine, Pensacola, Florida, has completed its 10,000th run. 613 men and 4 women (ages ranging from 2 to 56 years) have been tested at g-levels up to 13.0.

Anonymous 1952s
KITCHENS IN THE SKIES: HOT FOOD ON LONG RANGE FLIGHTS. — Tech. Data Digest (U. S., Central Air Documents Office), 17 (3): 2-3. 1952. DLC (Z5063.A2U65, v. 17)

A heating and refrigeration system to provide troops and air crews in flight with hot food on long missions is described. The equipment was developed by the Wright Air Development Center at Dayton, Ohio, under the direction of the Aero Medical Laboratory. Its principal features are light weight, expansibility according to size of personnel, safety against fire hazard, and economy in fuel and space. The refrigerator will maintain the required low temperature for 74 hours on 65 lbs. of dry ice. Standardization and simplification of the apparatus is in progress.

Anonymous 1952t
FIX SAFETY BELTS TO FLOOR. — Sci. News Letter, 62 (20): 315. 1952.
DLC (Q1.S76, v. 62)

An airliner crash in the water near LaGuardia Airport, New York, was studied by staff members of Cornell Medical College, New York. 16 of the 20 two-passenger seats were damaged, presumably by the strain of the belts, when the wearers were thrown forward by the impact of the crash. It is suggested that safety belts be attached to the hull, bypassing the seats.

Anonymous 1952u
THE ROYAL AUSTRALIAN AIR FORCE MEDICAL SERVICE. — Med. Jour. Australia, 2 (20): 723-724. 1952.
DSG (W3 AU677, v. 2)

Duties, duration and rank of appointment, postgraduate training, retiring age, pension, and reserve status of medical officers in the Royal Australian Air Force Medical Service are discussed.

Anonymous 1952v
FEEDING PROBLEMS DURING FLIGHT. — Nutrition Reviews, 10 (7): 205. 1952.
DLC (TX341.N85, v. 10)

Recent studies on nutrition problems of flight personnel and passengers are briefly reviewed. For short military flight missions "quick energy" rations have been found highly satisfactory. Carbohydrates seem to increase altitude tolerance. Food supplied must be simple and easily digestible, as the digestive processes are impaired in stress situations (combat). Liquid foods have proven most advantageous where conditions require wearing of oxygen and pressure equipment. However, no adequate means of keeping food hot during prolonged flight have so far been found.

Anonymous 1952w
THEY'RE OFF! — THE MONKEYS AND THE MICE: PHYSIOLOGICAL RESEARCH ON ANIMALS LEADING TO HUMAN SPACE-FLIGHT. — Western Aviation, 32 (11): 12. 1952.
DLC (TL5101.W4, v. 32)

Two monkeys and two mice have survived a ride to an altitude of 200,000 feet in Aerobee and V-2 type rockets fired from Holloman Air Force Base at Alamogordo, New Mexico. The experiment was carried out by the U. S. Air Force Air Research and Development Command. The monkeys had been anesthetized to prevent them from interfering with the recording instruments. The mice were placed in two separate drums, one smooth on the inside, the other provided with a small shelf. An initial acceleration of 15 g for less than one second was followed by 3 to 4 g for about 45 seconds. At the peak of the trajectory the animals were weightless. Films taken during the flight showed the "floating" mouse in a state of complete disorientation and unable to co-ordinate its movements. The mouse in the drum provided with a shelf was able to hold on to it and command its body at will. — A statement by Major Charles Yaeger on his reactions during near-zero-conditions (while following a ballistic trajectory) confirmed the fact that proper performance of the pilot is not impaired under such conditions.

Anonymous 1952x
MAN FROM MARS? NOPE — MAN FROM MOJAVE! T-1 ALTITUDE PRESSURE SUIT IS NEWEST PILOT PROTECTION DEVELOPMENT. — Western Aviation, 32 (11): 13. 1952.
DLC (TL501.W4, v. 32)

The T-1 altitude pressure suit was developed by the Air Research and Development Command of the Wright Air Development Center at Dayton, Ohio. It is worn uninflated, but inflates automatically when cockpit pressurization is lost. It combines altitude protection with anti-g suit features and incorporates crash helmet, oxygen mask, earphones, microphone, goggles and defroster, and oxygen bailout bottle. It has been designed for massproduction. The suit once saved the life of Col. Frank K. Everest of the U. S. Air Force during a high-altitude test flight over the U. S. A. F. Flight Test Center at Edwards (Mojave Desert). Cabin pressure was lost in his Bell X-1 after cracking of the canopy. The suit inflated instantaneously, permitting the pilot to land his craft safely.

Anonymous 1952y
HELICOPTER PLAYS AN EVER-INCREASING ROLE IN EVACUATION CHAIN. — Med. Bull. U. S. Army Far East, 1 (1): 17. 1952.
DSG (W2 A2 F54m, v. 1)

The helicopter dates back to an ancient idea but due to lack of an efficient power plant it was not fully utilized until recently. In 1937, a German company built a machine that flew from Berlin to Bremen. In the United States, Sikorsky designed the US-300 in 1939. In 1952, helicopter ambulance units in Korea, carrying three litter patients or four ambulatory patients together with the medical attendant and the pilot, became an integral part of the Army Medical Service in the combat area. The H-19 helicopter is illustrated in operation in Korea.

Anonymous 1952z
HELICOPTER AMBULANCE UNITS FOR EVACUATION OF CRITICALLY WOUNDED. — Jour. Michigan State Med. Soc., 51 (12): 1536. 1952.
DSG

New helicopter ambulance units will be used by the U. S. Army Medical Service to evacuate critically wounded patients from forward combat areas. They will consist of five two-rotor helicopters with a capacity of three litter patients or four ambulatory patients, a medical attendant, and a pilot. The first unit is being activated at the Medical Field Service School, Fort Sam Houston, Texas. Additional units will be formed in Korea. Organizational and training aspects are discussed.

Abt, J. C. 1952
and G. Friedman
A FACTOR ANALYSIS OF THE AIRMAN CLASSIFICATION BATTERY AC-1B WITH CONTROL TOWER OPERATOR (27251) TECHNICAL SCHOOL FINAL GRADE. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. PERS 52-46, Dec. 1952. 8 p. (Project no. 503-001-0001; AD 7853). UNCLASSIFIED

The final grades of 553 graduates of the control-tower operator technical school were inter-

correlated with the Airman Classification Battery AC-1B. Eight factors were extracted and rotated orthogonally to meaningful positions. The factors included mechanical experience, verbal comprehension, numerical facility, visualization, interest in things versus ideas, mechanical interest, technical interest versus aversion to technical interest, and age-education doublet. The common factor variance of the final school grade was 0.47. The numerical factor accounted for 66% of the variance, the verbal factor accounted for 17%, and the other 6 factors accounted for the remainder of the variance. (AD abstract)

Achiary, Terneau, and Buchet 1952
[VERTEBRAL INJURIES IN FLYING PERSONNEL] Traumatismes vertébraux du P. N. — Médecine aéronautique (Paris), 7 (4): 371-374. 1952. In French. DLC (TL555. M394, v. 7)

Nine cases of compression fractures of the vertebrae are presented. With regard to their etiology, four cases were due to plane crashes, two to helicopter accidents, two to parachute accidents, and one to catapulting from a ramp. Methods of x-ray interpretation and diagnosis are discussed in great detail.

Adams, M. M. 1952
INDEX TO HUMAN RESOURCES RESEARCH CENTER: 1952 PUBLICATIONS. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research bulletin no. 52-43, Dec. 1952. (AD 15841). UNCLASSIFIED

This is a complete list of the unclassified publications of the Human Resources Research Center published during the calendar year 1952 (Research bulletins, Technical reports, Conference notes, and Research notes). An author listing of the various categories of publication is followed by abstracts. Author, laboratory, and subject indexes conclude the pamphlet.

Adamson, G. L. 1952
FATIGUE. — Jour. Aviation Med., 23 (6): 584-588. 1952. DLC (TL555. A1A4, v. 23)

General fatigue during long, dull flights when there is no particular danger is characterized by a feeling of boredom and drowsiness. In flights at high speed or under fire, however, more severe stress is experienced due to constant alertness and anxiety combined. F. Bartlett considers fatigue as the failure of three functions: a breakdown of response to signals, followed by an increasing awareness of discomfort, which amounts to a lack of ability to anticipate. The improvement and eventual avoidance of the fatigue problem hinges on greater cooperation between the executive and medical branches in aviation. The executive branch should realize that fundamental medical problems are involved in flight; the lengthening and frequency of flight and individual variations of stress tolerance should likewise be considered. The medical participation would involve the education of flight surgeons and of aircrews in signs of fatigue, and discrimination between early, recoverable fatigue and advanced disturbances leading to neurotic illness.

Adiseshiah, W. T. V. 1952
SOME PSYCHOLOGICAL PROBLEMS IN FLYING TRAINING. — Indian Air Force Quart. (New Delhi), 2 (4): 57-63. 1952. DLC (UG635. I4I5, v. 2)

Psychological problems of aviation trainees are briefly analyzed in a popular way in terms of instructor-trainee and trainee-aircraft relationships. No general rules of conduct can be set up for the instructor. Each trainee is to be approached as an individual with his own leanings and idiosyncrasies. It is likewise difficult to set up standards of human response to machine action, such as norms for reaction speeds. In the case of the latter three factors have to be considered: (1) the speed elements involved in the operation (time interval between the occurrence of the signal and the initiation of the response — time taken to complete the action — resting time between one action and the signal for the next); (2) the speed load imposed on the operator (number of dials to be observed, number of controls, etc.). It has been shown experimentally that most operators display signs of lowered efficiency when more than five decisions per minute are required.

Adler, H. E. see Brown, John L., 1952b

(Aeronaut. Med. Equip. Lab.) 1952
A STUDY OF THE REQUIREMENTS FOR LETTERS, NUMBERS, AND MARKINGS TO BE USED ON TRANSILLUMINATED AIRCRAFT CONTROL PANELS. V. COMPARATIVE LEGIBILITY OF THREE FONTS OF NUMERALS. — Naval Air Experimental Station. Aeronautical Medical Equipment Lab., Philadelphia, Pa. Report no. TED NAM EL-509, part 5, June 13, 1952. 26 p., 7 plates. (TIP U22675). UNCLASSIFIED

Tests were made to determine the relative legibility of the standard AND 10400 (Air Force-Navy Aeronautical Design) and Berger type numerals and a proposed font having the following characteristics: 5/3 height to width ratio, 1/8 stroke width to height ratio, equal division of vertically segmented numerals, and curvilinear design. Three-digit combinations of each type were examined. A 200-millisecond observation was made by 30 subjects with 0.10 to 3.30 foot-lamberts (ft-L) of red transillumination (Corning filter No. 2412), and 5-msec. observations were made by 48 subjects with 11, 24, and 34 ft-L daylight illuminations (Westinghouse 40-watt daylight bulbs). The transparent numerals on black opaque backgrounds were all 2 in. high and 1.2 in. wide and had 0.25-in. stroke widths. Analysis of the total reading errors by the subjects indicated the superiority of the pro-

posed font under all the lighting conditions. Comparison of single-digit scores showed the same result wherever the difference in error scores was statistically significant. Utilization of the proposed font in plastic lighting plates was recommended. Application of these numerals to instrument dials is to be studied. (TIP abstract)

(Air Force) 1952
MEDICAL SERVICE: HEALTH HAZARDS IN AVIATION FUEL HANDLING. — Department of the Air Force, Washington, D. C. Air Force Pamphlet no. 160-6-2, Nov. 28, 1952. 8 p. DSG

The potential hazards involved in handling aviation gasoline and jet-engine fuels are fire or explosion, acute intoxication or systemic poisoning, and acute or chronic dermatitis or skin burns. The operations in which such hazards are encountered are primarily fuel storage and tank cleaning, fuel servicing, and engine maintenance. The report outlines briefly the chief methods of detection, control, protection, and treatment of injuries due to aviation fuels.

(Air Force) 1952a
SURVIVAL. — Department of the Air Force, Washington, D. C. AF Manual no. 64-5, Dec. 1952. 144 p. PB 112319

This manual is designed primarily for practical use to aid survival in any geographical location and under various climatic conditions. It outlines briefly methods of orientation, emergency shelter building, signaling, and water and food procurement. It describes ways of preparing emergency hunting devices and clothing, and construction of rafts and boats. The material is arranged by potential survival areas (land, sea, and ice).

Alanis, J. see Aviado, D. M., 1952, 1952a
Alexander, J. D. see Beard, E. F., 1952, 1952a

Alexander, L. 1952
and A. F. Ax
RORSCHACH STUDIES IN COMBAT FLYING PERSONNEL. — In: Relation of psychological tests to psychiatry, p. 219-243. Ed. by P. H. Hoch and J. Zubin. New York: Grune and Stratton, 1952. DSG

Correlated personality studies and Rorschach tests were carried out on 276 patients who had suffered from neurosis and psychopathic reactions during air-combat duty, and on 106 normal control subjects on active air combat duty. The Rorschach picture was found to reflect the existing amount of combat stress, both internal and external. The effects of combat on those who did not break down, according to the Rorschach test, were: (1) reduction of fantasy without loss of productivity or creativity; (2) general decrease of responsiveness to subtle nuances of feeling; and (3) shift of orientation from the general to the specific. Removal from stress, as well as subjection to increased stress, were strikingly reflected in Rorschach responses.

Allard, [A.] 1952
[PRACTICAL RESULTS OF THE PSYCHOLOGICAL EXAMINATION OF FLYING PERSONNEL IN TRAINING] Résultats pratiques de l'examen psychologique du personnel navigant formé. — Médecine aéronautique (Paris), 7 (4): 411-417. 1952. In French. DLC (TL555.M394, v. 7)

The Belgian air line Sabena sponsors two kinds of schooling for aviators: (1) a school of primary aviation training under the direction of the state, where students receive their license after having completed 260-300 flight hours; and (2), a school for higher aviation training, educating operational staff officers displaying intelligence, administrative capacity, self-confidence, leadership, endurance, etc. 70 of the trainees were subjected to psychological tests at the Psychotechnical Center at Utrecht, Netherlands; the results were compared with the evaluative reports issued by the primary aviation school. The agreement between the two ratings was as follows:

Identical evaluation	25 subjects	35.7%
Complete dissension of results	23 subjects	32.8%
Results did not warrant to draw any precise conclusion	22 subjects	31.5%

At the present development of psychological testing, these examinations are not yet reliable. A thorough character study of the individual pilot would be of great help to the selection officers.

Allard, A. 1952a
[AIRSICKNESS] Le mal de l'air. — Bruxelles-médical (Bruxelles), 32 (7): 327-334. 1952. In French. DSG

In investigating the etiology, physiology, pathology, symptoms, methods of prevention, and treatment of airsickness, the author reaches the following conclusions: The incidence of airsickness is considerably less than generally assumed. Statistics of the Belgian airline SABENA show that out of a total of about 230,000 passengers only 1.7% became airsick. Pressurization of cabins further reduced the rate of airsickness. Psychological factors play an important role in the incidence of airsickness. Among the preventives, those of the Dramamine type proved to be most effective.

Alluisi, E. A., 1952
G. S. Harker, J. M. Enoch, R. Wickersham, and J. L. McGraw
BINOCULAR STEREOPTIC ACUITY AND SPATIAL LOCALIZATION AS CRITERIA FOR THE EVALUATION OF CONTACT LENSES. — Army Medical Research Lab., Fort Knox, Ky. Report no. 70, Dec. 3, 1952. ii+25 p. (AMRL Project no. 6-95-20-001; TIP U23237). UNCLASSIFIED

A preliminary test was made of the hypotheses that changes in binocular stereoptic acuity (variable ranging error) and in spatial localization

(constant ranging error) take place when contact lenses are worn. Binocular stereoptic acuity (standard deviation of 10 rangings) and spatial localization (arithmetic means of 10 rangings) on a target at 3.02 m. were determined. The 3 subjects differed significantly in total performance when wearing spectacles, Dallos fluidless contact lenses, and Obrig fluid contact lenses. While wearing spectacles, 2 of the 3 subjects ranged the target significantly nearer than while wearing either of the contact lenses. The third subject showed no significant differences in spatial localization when the different lenses were worn. (TIP abstract)

Alluisi, E. A. 1952a
and Harker, G. S.
LINEAR PERSPECTIVE AS A SOURCE OF PSYCHOLOGICAL ERROR IN BINOCULAR STEREOSCOPIC RANGE FINDING. — Army Medical Research Lab., Fort Knox, Ky. Report no. 97, Oct. 7, 1952. 47 p. (AMRL Project no. 6-95-20-001; AD 2745). UNCLASSIFIED

Data obtained with a stereoptometer indicated that an error in ranging may result from a difference between the physical size of a target and the size an observer subjectively assumes it to be, or from a difference between the physical size of a target and the usual size of targets of the same type. The percentage mean errors obtained (0.20% to 2.35% with maximal conditions for the occurrence of an error) indicated that linear perspective alone is insignificant as a source of psychological error in normal ground employment of the binocular stereoscopic range finder. The data fail to verify the hypothesis that the variability of ranging is lowest when the cues of linear perspective are in greatest agreement with the visual ranging cues. The data suggest the operation of a summation effect in the interocular-vernier acuity task. Nonparametric considerations of the mean rangings of the targets used in the experiments tend to support a nativistically oriented, as opposed to an empiricistically oriented, approach to visual perception. Parametric considerations of the same data imply no clear advantage to either point of view. (AD abstract)

Alluisi, E. A., 1952b
K. Inaba, and F. L. Nungesser
CHANGES IN VISUAL DEPTH PERCEPTION WITH THE WEARING OF CONTACT LENSES. — Army Medical Research Lab., Fort Knox, Ky. Report no. 105, Dec. 2, 1952. 27 p. (AMRL Project no. 6-59-20-001; AD 5469). UNCLASSIFIED

Data for spectacles and each of three types of contact lenses (Obrig fluid, Obrig Lacrilens, and Dallos) at each of 6 times of measurement during a 460-minute wearing period were analyzed for 8 subjects. The differential performances with the different lenses in altering the stereoptic acuities (standard deviation of 15 rangings made with a stereoptometer on a target at 3020 mm) and the spatial localization (arithmetic mean of the 15 rangings) scores were dependent upon the differences among the subjects. Spatial localization socres tended to increase with time. (AD abstract)

Altland, P. D. 1952
and B. Highman
EFFECT OF REPEATED ACUTE EXPOSURES TO HIGH ALTITUDE ON LONGEVITY IN RATS. — Amer. Jour. Physiol., 168 (2): 345-351. 1952. DLC (QP1. A5, v. 168)

Rats were exposed to 18,000 feet altitude in a decompression chamber, 4 hours daily, beginning at 14 days of age until 540 days (late middle age). 53 exposed and 48 control animals were observed for longevity. 135 exposed and 61 controls were compared microscopically, including those that had died during longevity observations. In the experimental animals, hematocrit values of both sexes increased at a similar rate during the prepuberal period; after 70 days, however, the female hematocrit values leveled off at about 70%, indicating altitude adaption, while in the male they continued to rise to about 78%. Hemoglobin values remained constant (about 23 g./100 cc.). After 100 days the body weight of the exposed rats had decreased to 10-15% less than the controls. The death rate was higher among males than females, for exposed rats and controls alike. Pathological changes attributable to altitude occurred infrequently and were not severe. The same applied to decrease of reproductive functions. The kidneys and other organs were congested due to polycythemia. 18 of 87 rats exposed over 100 days showed focal and segmental fatty changes in the media of arteries, primarily in the arteries of the kidneys. The relationship between the increase of capillary and erythrocyte surface (due to the increase in hematocrit values) and the diffusion of gases and other substances to and from the blood stream into the alveoli and other tissues should be given careful consideration in interpreting physiological alterations at high altitudes.

Altland, P. D. see also Smith, Willie W., 1952

A[lvarez], W. C. 1952
RECENT STUDIES ON THE TREATMENT OF MOTION SICKNESS. — Gastroenterology, 21 (2): 310. 1952. DLC (RC799. A634, v. 21)

Progress in the treatment of motion sickness is briefly reviewed. Dramamine, hyoscine, and a combination of Benadryl and hyoscine are considered to be the most successful remedies.

Ambler, R. K. see Poe, A. C., 1952b

Ames, S. W. 1952
HANG ONTO YOUR HAT! — Flying Safety, 8 (4): 21. 1952. DNACA

The necessity is stressed of close fit and proper attachment of oxygen helmets, to safeguard retention of the oxygen mask in case of ejection or high-speed bailout.

Anastasi, A. 1952
and J. P. Foley
PSYCHIATRIC SELECTION OF FLYING PERSONNEL. V. THE HUMAN-FIGURE DRAWING TEST AS AN OBJECTIVE PSYCHIATRIC SCREENING AID FOR STUDENT PILOTS. — Oct. 1952. iii + 30 p. Fordham Univ., New York, and Psychological Corporation, New York (Contract AF 41(128)-45); issued by School of Aviation Medicine, Randolph Field, Tex. (Project no. 21-37-002, Report no. 5). DSG
PB 108275

A Draw-a-Person Test, administered to entering student pilots as part of the Randolph Field Battery of experimental psychiatric screening tests, was analyzed experimentally using an objective scoring check-list devised by the authors. A provisional list of items, discriminating between 50 well-adjusted-pass and 50 maladjusted-fail cadets, failed to discriminate significantly between two similar groups in a second, independent sample. The results, therefore, fail to support the use of the draw-a-person technique when analyzed by the present checklist method. (School of Aviation Medicine abstract)

Anderton, D. A. 1952
WILL PRONE FLIGHT LICK HIGH G-LOADS?— Aviation Week, 57 (26): 21-22, 24-25. Dec. 29, 1952. DLC (TA501.A8, v. 57)

The prone position of the pilot in high-speed airplanes has certain advantages (higher g-tolerance of the pilot, reduction of drag due to decrease of frontal area, improved instrument visibility) and drawbacks (narrowing of field of vision, decrease of visual acuity, aggravation of claustophobic tendencies, discomfort encountered in this abnormal position). A nylon bed designed in 1948 by the Aero Medical Laboratory was tested for 8 to 12 hours without apparent signs of discomfort. Three-dimensional hand control (i. e. operation of all the control surfaces by hand motions only) likewise gave good test results. Restriction of vision (up to 35°) was one of the major complaints raised by the test pilots. — The paper concludes with a brief discussion of flight tests at accelerations of less than 1 g, as would be encountered in space flight. The prone pilot was instrumented for recording of heart rate and electrocardiogram. He was asked to shake his head and to nod during the runs at zero g. There were no ill effects following these movements, but after the subgravity flight there was frequent vertigo. Coordination was not impaired, although there was a tendency to overreach.

Anson, B. J. 1952
BIOPHYSICS OF SOUND PERCEPTION WITH RESPECT TO ANATOMY. — In: Noise—causes, effects, measurement, cost, control, p. 59-70. Ann Arbor, Mich.: Univ. of Mich. Press, 1952. DLC (RA772.N7M5)

The slow development of otological research is, in part, due to the inaccessibility of the end-organ of hearing. The general relationships of the labyrinth, middle ear, and the external meatus are discussed; in addition, detailed illustrations are supplied on the development of the auditory apparatus (from embryonic stages to the adult). The history of the study of the otological anatomy and physiology is briefly discussed. Early information was derived from examination of specimens obtained at autopsy and was followed by extensive microscopic studies. Most of the present information, however, was obtained through modern surgery and medicine. The physiology of the various parts of the ear is discussed. It is emphasized that full understanding of the physiology and pathology of the human ear may be reached only through the knowledge of the evolution of each of its components.

Archer, J. D. see Clements, R., 1952

(Armed Forces-NRC Vision Comm.) 1952
MANUAL OF INSTRUCTIONS: ARMED FORCES VISION TESTER. Revised ed. 2+24 p. Ann Arbor, Mich.: Univ. of Michigan, Nov. 1952. (TIP U17665).

The visual functions examined by the standard form of the Tester are vertical and lateral phoria at distance and near, right and left eye acuity at distance and near, and depth perception at distance. Optional tests include binocular acuity at distance and near, and prism divergence at near. One person at a time can be tested. The examinee observes test slides while the examiner asks standard questions the answers to which are used to determine the score. Instructions for administering the tests and preparing the scores are given together with samples of the scoring keys, record cards, and test slides. (TIP abstract)

Armstrong, E. D. see White, C. S., 1952

Armstrong, G. E. 1952
MILITARY MEDICINE IN KOREA. — Military Surgeon, 110 (1): 8-14. 1952. DLC (RD1.A7, v. 110)

The contribution of the Air Force in the evacuation of casualties is extolled briefly in this survey of the achievements of military medicine in the Korean War. Helicopters have proven particularly useful where terrain conditions made any other form of rapid evacuation prohibitive.

Armstrong, H. G. 1952
[AIR EVACUATION IN KOREA]. — Military Surgeon, 110 (1): 18. DLC (RD1.A7, v. 110)

In addressing the annual convention of the Association of Military Surgeons (Chicago, October 8, 1951), the author points out the improvements made during the Korean War with regard to air evacuation of casualties, as compared to World War II. 200,000 sick and wounded have been carried so far in a relay transportation system from the front to hospitals in the United States. The greater passenger capacity and wider range of

modern aircraft have been instrumental factors in this improvement. A record was set by flying 127 patients in one aircraft from Korea to Japan.

Armstrong, H. G. 1952a
PRINCIPLES AND PRACTICE OF AVIATION MEDICINE. — 3rd ed., x+476 p., 2 plates. Baltimore: Williams and Wilkins Co., 1952. DLC (RC1062.A7, 1952)

The third edition of this fundamental textbook of aviation medicine does not differ basically from the second edition. It is slightly abbreviated (467 p., against 514 p. in the second edition), and the arrangement of the material as well as the chapter headings have partly been changed. Thus the content of Chapter 13 of the older edition ("Effect of Flight on the Ear") has been moved to Chapter 16 ("Effects of Aircraft Noises"). The section dealing with aptitude tests for flight trainees (Chapter 10) has been enlarged and includes an extensive synopsis of various tests. Information on flying equipment (Chapter 26) has been brought up to date, and new and more recent illustrative material has been incorporated.

Arnould, P. 1952
and M. Lamarche
[MODIFICATIONS OF THE BLOOD MASS AND THE INTERSTITIAL FLUIDS DURING ACUTE ANOXIA IN THE CHLORALOSED DOG] Modifications de la masse sanguine et des liquides interstitiels au cours de l'anoxie aiguë chez le chien chloralosé. — Médecine aéronautique (Paris), 7 (4): 522-528. 1952. In French. DLC (TL555.M394, v. 7)

Chloralosed dogs were subjected to acute anoxia by breathing a mixture of 10% oxygen and 90% nitrogen. During anoxia, part of the blood plasma passed to the interstitial spaces and thus produced an increased hemoconcentration (nevertheless, the total of extracellular fluid remained unchanged). The total blood cell volume remained constant. Oxyhemoglobin saturation was reduced from a normal 94.4% to 69.6%.

Arnould, P. see also Grandpierre, R., 1952b, 1952h

Aschan, G. 1952
[CUPULOMETRY AS AN AEROMEDICAL TESTING METHOD] Cupulometrien som flygmedicinsk undersökningsmetod. — Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 1952 (1): 4-6: 1952. In Swedish. DSG

The cupulometric method constitutes an improvement over the old rotating-chair methods (such as the Bárány test) in which the stimuli surpass qualitatively and quantitatively those encountered under normal circumstances. Cupulometry is carried out in such a way that the speed of rotation does not exceed 50°-60° per second. Instead of the subject being rotated on a chair within a room, he is placed in a rotating chamber. The acceleration is controlled so as not to exceed the stimulus threshold of the cupular organs (about 0.5° per sec.^{2}). Only when the rotation chamber is brought to a sudden stop will the subject perceive a sensation of rotation and show post-rotative nystagmus opposite to the direction of rotation. The first applications of this method gave surprising results. A test carried out on a number of normal, healthy flying cadets revealed that none of them had a "normal" cupulogram. Stimulus thresholds were substantially raised, and subjective as well as objective time values were lowered markedly. All these data point at a reduced vestibular sensitivity. An asymmetric right and left response was frequently observed, a phenomenon which gibed with reports from the pilots that all their planes had a tendency to roll more easily to one side.

Astbury, A. K. 1952
PROGRESS IN MILITARY MEDICINE IN BRITAIN. — Military Surgeon, 110 (2): 132-133. 1952. DLC (RD1.A7, v. 110)

Recent advances in aviation medicine are briefly summarized. Among the specific items mentioned are the development of anti-g equipment, control of body temperature by proper clothing, prevention of motion sickness, and evacuation by helicopter.

Åström, A. 1952
ON THE ACTION OF COMBINED CARBON DIOXIDE EXCESS AND OXYGEN DEFICIENCY IN THE REGULATION OF BREATHING. — Acta physiologica scandinavica (Stockholm), Suppl. 27 (98). 61p. 1952. In English. DSG

Anesthetized dogs were exposed to inhalation of air containing an excess of carbon dioxide and being deficient in oxygen. Arterial pH and O_2 saturation could be varied at will with the aid of a pneumothorax and of artificial respiration with different compositions of gas. Alveolar pCO_2 and pO_2 were measured simultaneously. The respiratory behavior was studied with the chemoreflex mechanism intact or with exclusion of chemoreflex influences. Respiration was found to be stimulated by CO_2. The stimulating effect of O_2 deficiency was found to be inversely proportional to the arterial pH. Breathing was stimulated markedly by intravenous injection of sodium cyanide at a low pH. A theory on the action of combined CO_2 excess and O_2 deficiency is evolved and practical applications of the findings are suggested.

Åström, A. 1952a
[EXPERIENCES GAINED FROM FLYING INSTRUCTION COURSES FOR FLIGHT SURGEONS, SEPTEMBER 1951]. Efarenheter från flygkursen för flygläkare, september 1951. — Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 1952 (1): 15-17. 1952. In Swedish. DSG

The history of flight surgeon training in the Swedish Air Force, since 1945, is reviewed. In 1950 a two-month flight course was introduced. A breakdown of the curriculum of this course is presented.

Atkinson, C. J. 1952
ADAPTATION TO DELAYED SIDE-TONE-1. — May 23, 1952. 5+5 p. Ohio State Univ. Research Foundation, Columbus (Contract N6onr-22525); and Naval School of Aviation Medicine, Pensacola, Fla. (Project report no. NM 001 064.01.12; Joint research report no. 12). (TIP U22934). PB 107344

The side tone of speakers was delayed while 60 phrases were read; the phrases were read slower and louder than phrases read without delayed side tone. Speakers showed no adaptation in sound-pressure level or speech duration to delayed side tone during the reading of the phrases. The results showed that a speaker reads louder and slower for approx. the first 75 sec. after the introduction of side-tone delay. (TIP abstract)

Atkinson, C J. 1952a
INTELLIGIBILITY OF SPEECH HEARD AT HIGH ALTITUDE AND SEA LEVEL. — Oct. 30, 1952. 7+7 p. Ohio State Univ. Research Foundation, Columbus (Contract N6onr-22525); and Naval School of Aviation Medicine, Pensacola, Fla. (Project report no. NM 001 064.01.14; Joint project report no. 14) (AD 1014). PB 108549

Four groups of 10 men each took part in speech-intelligibility tests conducted during simulated altitude runs at 43,000 ft. About half of each group served a speaker-listeners at altitude, and the other half functioned as listeners at sea level. Each speaker said about 14 words from the multiple-choice intelligibility test, while the listeners crossed out 1 of 4 alternatives for each word. Each man wore a helmet with one earphone, while the other ear was open to the noise environment of 110 db. simulated aircraft noise. The speakers received response scores that gradually increased through the 15 runs. There was no significant difference between listener scores at sea level and at altitude. Speaking at altitude tended to restore the O_2-CO_2 balance in the blood. (AD abstract)

Atria, N. F. 1952
AEROMEDICAL PROBLEMS OF JET FLYING. — U. S. Air Force Med. Service Digest, 3 (2): 30-32. 1952.
DSG (W2 A403u, v. 3)

The medical problems encountered in jet plane flight are different from those of propeller-driven flight. The main problems concern bailout, high altitude, and noise. — As to bailout from jet planes, the USAF uses an ejection seat which is catapulted by an explosive charge along two guide rails. — The effects of high altitude may be prevented in one of three ways: wearing a pressure suit (this has been discontinued as it makes the operation of the plane difficult); the use of pressurized cabins (without pressurization, the average flyer may be able to fly at 46,000 feet for about 25 minutes, beyond this time the blood would pool or filter into the tissues); and pressure breathing (this requires a revision of the pilot's breathing habits and may induce chest pains because of the stretching or rupture of alveoli). These methods may also be combined, e.g., pressure breathing in a partially pressurized cabin. — High-intensity noise may induce a temporary hearing loss, e.g., a loss of 20 decibels in a sound field of 120 decibels within 30 minutes.

Austin, T. R. <u>see</u> Sleight, R. B., 1952

Aviado, D. M., 1952
A. Cerletti, J. Alanis, P. H. Bulle, and C. F. Schmidt
EFFECTS OF ANOXIA ON PRESSURE, RESISTANCE AND BLOOD (P^{32}) VOLUME OF PULMONARY VESSELS. — Amer. Jour. Physiol., 169 (2): 460-470. 1952. DLC (QP1.A5, v. 169)

The factors interacting in the regulation of the pulmonary circulation under conditions of anoxia (5-10% oxygen) were studied in dogs. Anoxia produced a rise in pulmonary arterial pressure which can best be explained as the result of the increased pulmonary blood flow brought about by carotid and aortic chemo-reflexes through the liberation of epinephrine. Dilatation of pulmonary vessels can be seen when the lung is perfused with oxygen-deficient blood. During anoxia there is an increase in the blood content of the lung (demonstrated by radioactive phosphorus, P^{32}).

Aviado, D. M., 1952a
A. Cerletti, J. Alanis, P. H. Bulle, and C. F. Schmidt
DILATING ACTION OF ANOXIA ON PULMONARY VESSELS. — Federation Proceedings, 11 (1[1]): 6. 1952. DSG

Anesthetized dogs inhaling 5 or 10% oxygen showed: (1) a pressure increase of about 30 mm. H_2O in the cannulated lobar artery at 60% O_2 saturation of the arterial blood; (2) vasodilatation in an isolated perfused lung when oxygen-deficient ventilating air or perfusing blood were applied; and (3) an increase of capillary blood volume in the lungs by about 10% (measured by tagging erythrocytes with P^{32}). The physiological mechanism is explained.

Ax, A. F. <u>see</u> Alexander, L., 1952

Axelrod, D. R. 1952
and R. F. Pitts
ANOXIA AS A FACTOR IN RESISTANCE TO MERCURIAL DIURETICS. — Amer. Jour. Physiol., 169 (2): 350-356. 1952.
DSG

Salyrgan, a mercurial diuretic, was injected intravenously into 2 healthy dogs fitted with masks through which they inhaled air mixtures containing 8% oxygen. The resulting anoxia prevented the natriuresis and chloruresis which would normally have been induced by the diuretic. This blocking of mercurial action is attributed to the

stimulating effect of anoxia on the adrenal cortex. An explanation of the physiological mechanism involved is attempted.

Axelrod, D. R., 1952a
and R. F. Pitts
EFFECTS OF HYPOXIA ON RENAL TUBULAR FUNCTION. — Jour. Applied Physiol., 4 (7): 593-601. 1952. DLC(QP1.J72, v. 4)

Hypoxia was induced in two dogs and in two young men by inhaling nitrogen-air mixtures, while the oxygen content of the blood was recorded. Moderate hypoxia increased urinary flow, severe hypoxia, on the other hand, produced oliguria. The results showed however, that both in man and in the dog the renal tubular mechanisms for secretion of para-aminohippurate and for absorption of glucose are highly resistant to moderate or severe anoxia.

Baczewski, Z. J. see Comfort, E., 1952
Baguenier-Desormeaux, L. see Grandpierre, R., 1952g

Bahrick, H. P., 1952
R. E. Rankin, and P. M. Fitts
THE EFFECT OF MOTIVATION UPON PERIPHERAL PERCEPTION DURING THE PERFORMANCE OF A CENTAL PSYCHOMOTOR TASK. — Apr. 10, 1952. v+7 p. Ohio State Univ., Columbus (Contract AF 33(038)-10528); and Air Training Command. Human Resources Research Center. Perceptual and Motor Skills Research Lab., Lackland Air Force Base, Tex. Research bulletin no. 52-14 (Project no. 509-020-0004; TIP U22576). PB 107043

The experiment tested the hypothesis that an increase in motivation results in increased perceptual selectiveness favoring those parts of the stimulus field which are perceived as most relevant to existing motivational condition. Reactions to peripheral stimuli were measured in three ways: (1) reporting on intermittently-presented peripheral lights when attention had not been directed to them; (2) reacting to intermittently-presented lights when attention had been directed to them; (3) reacting to a peripherally-located dial whose pointer periodically moved off center. Two conditions of motivation were used. The experimental results are in good agreement with the prediction that a condition of high motivation facilitates performance of a central (tracking) task but, in general, interferes with the performance of peripheral tasks. The detrimental results of high motivation (bonus) upon peripheral performance was most pronounced on the peripheral task in regard to which there was no expectation of reward, and least pronounced on the peripheral task in which expectation of reward was greatest. (From the authors' summary)

Bair, J. T. 1952
NON-TEST PREDICTORS OF ATTRITION IN THE NAVAL AIR TRAINING PROGRAM. — Naval School of Aviation Medicine, Pensacola, Fla. April 28, 1952. 2+3+4 p. (Project report no. NM 001 058.05.02; TIP U22451). UNCLASSIFIED

Nontest factors (age, formal education, and college-course performance) were analyzed for 375 cadets divided into 3 criterion groups: 119 who successfuly completed basic training, 135 who withdrew at their own request, and 121 who failed either the ground-school or flight-training phase. Results indicated that the cadets most likely to satisfactorily complete the program were high-school graduates under 21 who had no prior academic course failures. Attrition appeared more probable for college-trained cadets with poor pretraining academic performance and low flight-aptitude test ratings. (TIP abstract)

Bair, J. T. 1952a
and E. P. Hollander
THE SIGNIFICANCE OF ATTITUDES TOWARD PEERS IN DISCRIMINATION BETWEEN NAVAL AVIATION CADETS OF "HIGH" AND "LOW" MOTIVATION. — Naval School of Aviation Medicine, Pensacola, Fla. Aug. 1952. 8 p. (Project report no. NM 001 058.05.04; TIP U24637). UNCLASSIFIED

The high- and low-motivation groups were composed of the same cadets previously studied (cf. Hollander, E. P., 1952). Each person completed anonymously an open-ended questionnaire form that instructed him to describe a sample of behavior characteristic of his best and his worst fellow cadets. The cadets with high motivation placed more value on the personal and social factors of their fellow cadets; the low-motivation group stressed the academic values. A qualitative comparison between combat pilots and successful cadets in describing their teammates indicated a great similarity. (TIP abstract)

Bair, J. T. 1952b
THE CHARACTERISTICS OF THE WANTED AND UNWANTED PILOT IN TRAINING AND IN COMBAT. — Naval School of Aviation Medicine, Pensacola, Fla. Memorandum report—Morale report no. 2, Feb. 25, 1952. 16 p. (TIP U69668). UNCLASSIFIED

One hundred Naval Aviation cadets who had successfully completed basic flight training in the fall of 1951, were requested to fill out a specially designed attitude questionnaire. Opinions were solicited regarding the best and worst cadets known to the individuals, substantiated by accounts of incidents typifying the kind of attitude and behavior in question. In analyzing the replies, the following five traits were found to characterize the ideal type of pilot for training and combat duties: (1) a deeply ingrained sense of teamwork and "consideration for the other fellow"; (2) keen interest and skill in flying; (3) stability in the air and on the ground; (4) an easy going temperament

that enables the pilot to get along with all types of people; and (5) ability to accept responsibility and to be a good shipmate.

Bair, J. T. see also Hollander, E. P., 1952, 1952a

Baldes, E. J. 1952
and J. J. Ryan
CRASH-WORTHINESS OF AIRCRAFT AND CRASH INJURY PREVENTION. — Jour. Aviation Med., 23 (5): 433-438, 455. 1952.
DLC (TL555.A1A4, v. 23)

The problem of prevention of aircraft crash injuries is discussed. As frequently there is little evidence to separate the human, the mechanical, and the environmental factors of accidents, all planes should be provided with adequate instruments, and recording of the flight path is of primary importance. Features increasing the chances of survival would be as follows: (1) one-third of the tubular fuselage should be available to absorb the energy of the crash; (2) the most important consideration should be given to seats (backward facing seats, harness, etc.); (3) release of an external drag chute would assist in slowing down the plane; (4) the under portion of the fuselage should be flexible to absorb the energy of deceleration in a uniform manner; (5) parachutes should be available to break the fall; (6) properly engineered safety features should be provided to reduce the fire hazard.

Balke, B. 1952
CORRELATION OF STATIC AND PHYSICAL ENDURANCE. I. A TEST OF PHYSICAL PERFORMANCE BASED ON THE CARDIOVASCULAR AND RESPIRATORY RESPONSE TO GRADUALLY INCREASED WORK. — School of Aviation Medicine, Randolph Field, Tex. Apr. 1952. iii+14 p. (Project no. 21-32-004, Report no. 1).
DSG (W1 UN7644) UNCLASSIFIED

The purpose of this study is to establish a reliable test of physical performance, based on the cardiovascular and respiratory responses to gradually increased muscular activity on the treadmill. Pulse rate and blood pressure were taken every minute and gas exchange rates were determined at different intervals. Cardiovascular and respiratory activities increased in direct relation to the work load up to a certain optimum. From there on the oxygen uptake became inadequate and pulmonary ventilation increased out of proportion to the oxygen uptake. This respiratory incompetence was generally accompanied by signs of cardiovascular inadequacy (decrease in pulse pressure, increase in heart rate). The influence of conditioning and deconditioning upon the physical performance of a group of 20 cadets was studied and showed up clearly in the scores. On the basis of these findings, a rating system is suggested by which the physical performance of individuals can be evaluated according to the work performed and/or according to the duration of the test.

Ballin, J. C. see Feinstein, R. N., 1952

Ballinger, E. R. 1952
HUMAN EXPERIMENTS IN SUBGRAVITY AND PROLONGED ACCELERATION. — Jour. Aviation Med., 23 (4): 319-321, 372. 1952.
DLC (TL555.A1A4, v. 23)

Aviators were exposed to periods of essentially zero gravity of 15 to 25 seconds duration (in a jet plane which was pulled up vertically and moved in a ballistic trajectory, with the power cut off). As long as the subjects were held in place by safety belts and could see their surroundings, they did not lose their orientation. Coordination of movements was almost unimpaired. In the pull-out maneuver (3-4 g), head motions frequently resulted in vertigo. — In another series of tests, subjects in supine position were exposed to prolonged accelerations on a centrifuge, simulating the take-off of a space rocket. Accelerations ranging between 3 g for 9 minutes 31 seconds and 10 g for 2 minutes 6 seconds were tolerated, some with transitory substernal or epigastric discomfort and shortness of breath. An acceleration of 8 g is considered most appropriate from both the physiological and mechanical standpoints.

Ballinger, E. R. see also Henry, J. P., 1952
Barach, A. L. see Beck, G. J., 1952

Barch, A. M. 1952
PERMANENT WORK DECREMENTS IN THE PERFORMANCE OF A PURSUIT TASK ARISING FROM SHORT PERIODS OF MASSED PRACTICE. — Jan. 1952. v+5 p. State Univ. of Iowa, Iowa City (Contract AF 33(038)-13214); issued by Air Training Command, Human Resources Research Center, Lackland Air Force Base, Tex. Research bulletin no. 52-2 (Project no. 509-020-0001; TIP U21741).
UNCLASSIFIED

Two groups of subjects were administered the pursuit rotor test under different conditions. On each of 2 successive days men in both groups were given 5 blocks of 6 trials each. Both groups had a 5-min. rest period between blocks. The distributed-practice group were given 45 sec. of rest between trials, whereas the massed-practice group had no rest. The performance for the massed-practice group was poorer than that of the distributed-practice group, and remained inferior after rest. The difference was evident after 90 sec. of massed practice. (TIP abstract)

Barron, C. I. 1952
THE DANGER MAN FACES IN FLIGHTS ABOVE 50,000 FEET. — SAE Jour., 60 (7): 24-27. 1952. DLC (TL1.S5, v. 60)

A review of the principal problems of high-altitude flight, aimed at the uninitiated reader, is presented. Among the subjects discussed are hypoxia, low temperature and temperature fluctuations, explosive decompression, ultraviolet and cosmic radiations, and safeguards against these various hazards. Dangers of interplanetary flight are briefly summarized.

Bartlett, D. J. 1952
and D. G. C. Gronow
MANUAL DEXTERITY AND TACTILE SENSITIVITY IN THE COLD. — Flying Personnel Research Committee (Gt. Brit.). Report no. FPRC 806, Nov. 1952. 20+6 p.
DSG (W1 qG R355)

Manual dexterity and tactile sensitivity tests were performed on 18 subjects in a cold chamber. The subjects were divided into three groups, each exposed to temperatures of -10°C. for a different length of time (1/2 to 1 1/2 hours). To aid interpretation of results, a second identical test was carried out at room temperature. In a third experiment, a group of 6 subjects was given the tactile sensitivity test and one of the manual dexterity tests before entering the cold chamber and during a 40-minute exposure period. — In the first experiment, all three groups showed considerable and progressive impairment of performance in all dexterity tasks. Tactile sensitivity improved during the first 30 minutes of exposure in all 3 groups. Upon leaving the chamber, all subjects manifested a return to normal in their performance, with variations among individuals. The result of the third experiment indicated that the improvement of tactile sensitivity in cold surroundings observed in the first experiment may be attributed to a "learning factor". Manual dexterity may be affected in a similar manner. Exposure to cold prevented the normal improvement of manual dexterity but not of tactile discrimination.

Basgal, W. see Mendes, M. F., 1952c

Bauer, L. H. 1952
SPACE MEDICINE. — West Virginia Med. Jour., 48 (11): 326-327. 1952. DSG

A brief summary of the physiological problems connected with high-altitude and space flight is presented.

Bauer, R. O., 1952
E. H. Dustin, G. L. Maison, J. W. Stutzman, J. T. Gourzis, G. Prochnik, and B. B. Young
THE EFFECTS OF DRUG-INDUCED ALTERATIONS OF THE AUTONOMIC NERVOUS SYSTEM ON THE RESPONSES OF MAMMALS TO OXYGEN DEPRIVATION. — June 1952. vi + 49 p. Boston Univ., Mass. (Contract W33(038) ac-18469); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-222 (RDO no. 696-61). (ATI 171 952).
UNCLASSIFIED

The following papers contained in this report have been abstracted separately:
Bauer, R. O., 1952a
Brown, B., 1952
Dustin, E. H., 1952
Maison, G. L., 1952
Prochnik, G., 1952

Bauer, R. O. 1952a
and J. [T.] Gourzis
LETHALITY OF SIMULATED ALTITUDE FOR RABBITS, NORMAL AND PRETREATED WITH TETRAETHYL PYROPHOSPHATE OF DIBENAMINE. — In: Bauer, R. O., and others, The effects of drug-induced alterations..., p. 44-49. Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-222, June 1952 (RDO no. 696-61) (ATI 171 952). UNCLASSIFIED

This is a reprint of the paper, Bauer, R. O., 1951 (Jour. Aviation Med., 22 (6): 525-529). Albino rabbits were exposed successively to increasing simulated altitudes of 25,000 to 40,000 feet. At each altitude the animals were held for five minutes, then returned to ground level before renewed ascent. Chamber temperatures were recorded before, during and after exposure. It was observed that environmental temperatures affected altitude tolerance considerably (25° C. representing the optimum temperature with regard to altitude tolerance). Preliminary treatment with adrenergic blocking agents (such as dibenamine) or with cholinergic potentiation drugs (such as tetraethylpyrophosphate) reduced altitude tolerance significantly.

Bazarnik, K. see Whiteside, T. C. D., 1952a
Beach, A. M. see Grierson-Jackson, W., 1952

Beals, L. S. 1952
THE HUMAN OPERATOR AS A LINK IN CLOSED-LOOP CONTROL SYSTEMS. — Electr. Eng., 71 (4): 319-324. 1952.
DLC (TK1.A61, v. 71)

Problematic aspects of human engineering are briefly analyzed. The juxtaposition of biological and engineering sciences demands semantic clarifications and adoption of common terms and dimensions. The fundamental problem, however, is the necessity of reducing the complexities of human behavior and neuromuscular responses to terms and units expressible in mathematical terms. The magnitude of the task has been exemplified in pilot-control studies. While successful reduction of the human element to computer factors seems to have been accomplished in the introduction of the "automatic pilot", such basic factors as planning the flight, responding to unforeseen situations (e.g., meteorological conditions), fulfilling of certain missions, etc., are completely disregarded. In such limited tasks as aiding in the design of efficient aircraft control systems, human engineering has been partly successful, but has failed to open an insight into the basic neuromuscular processes involved.

Beals, L. S. 1952a
THE GENERAL PRACTICE OF TRAINING. — Jour. Aviation Med., 23 (3): 271-279. 1952
DLC (TL555.A1A4, v. 23)

Before analyzing the principles of good training and training equipment, the author defines the

concepts of human engineering, communication, and the difference between education and training. The full benefit of a training program can be secured by the joint efforts of the psychologist, the subject specialist, and the human engineer. The description of the objectives of the program in form of requirements, and the planning phase should be in the hands of a psychologist having the continuous support of the subject specialist. During the implementation phase, overadministration should be avoided. All that has been done in planning and starting a training program, should be validated and compared with the arbitrary values set in the requirement phase. This is the stage where the human engineer takes over: statistics will reveal not only whether the original objectives have been fulfilled but also the possible shortcomings of the program. — The importance of the training equipment should not be overemphasized; it should be regarded as a medium for the communication of a concept and should never be separated from the training program.

Bean, J. W. 1952
THE HYPOPHYSIS AS A DETERMINANT IN THE REACTION OF THE MAMMAL TO OXYGEN AT HIGH PRESSURE. — Amer. Jour. Physiol., 170 (3): 508-517. 1952.
DLC (QP1.A5, v. 170)

Hypophysectomized rats and intact controls were exposed once a day to oxygen at high pressure (OHP) and to subsequent decompression. The experiments revealed that hypophysectomized rats, as compared to the controls, showed (1) an increased resistance to OHP; (2) longer threshold times for the onset of neuromuscular response; (3) less severe reactions; (4) no residual paralysis; (5) a decreased mortality rate; and (6) a considerably lesser degree of pulmonary damage. Injection of ACTH lessened, but did not completely nullify, the effect of the hypophysectomy. The physiological interrelationship of hypophyseal function with phenomena generally associated with reactions to OHP (such as metabolic change and retention of accumulated metabolites, the direct toxic action on enzyme systems, and the pulmonary damaging action of OHP) are discussed.

Bean, J. W. 1952a
and P. C. Johnson
INFLUENCE OF HYPOPHYSIS ON PULMONARY INJURY INDUCED BY EXPOSURE TO OXYGEN AT HIGH PRESSURE AND BY PNEUMOCOCCUS. — Amer. Jour. Physiol., 171 (2): 451-458. 1952.
DLC (QP1.A5, v. 171)

Equal groups of hypophysectomized and intact rats were exposed to oxygen at high pressure (about 80 pounds) (OHP) for several minutes, once a day over several weeks. Upon completion of exposure the rats which had not succumbed during the experiment were killed and the lungs removed from all the animals. While lung damage was comparatively slight in the hypophysectomized rats, the lungs of the intact animals revealed marked changes, such as congestion, "hepatization" (striking resemblance to liver in color and consistency), gross hemorrhages, edema, atelectasis, hemorrhage (gross and by diapedesis), bronchiectasis, peribronchial inflammation, and emphysema. OHP did not protect against pneumococcus infection. Administration of ACTH had no effect on OHP resistance of the rats.

Bean, J. W. 1952b
and C. W. Smith
HYPOPHYSEAL FACTOR IN THE INDUCTION OF PULMONARY DAMAGE BY OXYGEN IN HIGH CONCENTRATIONS AT ATMOSPHERIC PRESSURE. — Amer. Jour. Physiol., 171 (3): 707-708. 1952. (DLC QP1.A5, v. 171)

Hypophysectomized and nonhypophysectomized rats were kept in a chamber with a continuous flow of O_2 in which CO_2 was absorbed and the temperature regulated. Within 20 hours, all nonhypophysectomized rats were dyspneic. At 72 hours, all of them had either succumbed or were sacrificed. The pulmonary tissues had a hepatoid appearance and the thorax was filled with clear nonbloody fluid. In the hypophysectomized animals, little or no dyspnea was observed until after 30 hours' exposure, and they all were in fairly good condition after 72 hours. — Rats divided into two groups as before, but inhaling fresh air under identical conditions, remained unaffected.

Bean, J. W. see also Whitehorn, W., 1952

Beard, E. F., 1952
J. D. Alexander, and T. W. Howell
EFFECTS OF VARIOUS DEGREES OF HYPOXIA ON PULMONARY AND SYSTEMIC HEMODYNAMICS IN NARCOTIZED DOGS. — Jour. Aviation Med., 23 (6): 569-576, 625. 1952.
DLC (TL555.A1A4, v. 23)

Heart rate, respiratory rate, and femoral and pulmonary arterial pressures were studied in narcotized dogs breathing various oxygen-deficient gas mixtures. The following results were obtained: (1) Inhaling a mixture of 8.5% oxygen in nitrogen for 30 minutes produced an increase in both systolic and diastolic systemic arterial pressures but no concomitant changes within the pulmonary artery; while all animals showed an increase in the heart rate, no significant changes were noted in the respiratory rate. (2) When 5.8% oxygen in nitrogen was inhaled for short periods, pulse rate, respiratory rate, and arterial pressure gradually increased during the first five minutes; all animals survived the 10-minute exposure without complications. (3) Following sudden anoxia, produced by inhaling 99.6% nitrogen, pulse rate, respiratory rate, and femoral systolic and diastolic pressures began to increase and reached their maxima after one minute.

Beard, E. F., 1952a
J. D. Alexander, and T. W. Howell
DYNAMICS OF BLOOD FLOW UNDER ABNORMAL PRESSURE. II. EFFECTS OF ACUTE HYPOXIA AND ANOXIA ON PULMONARY ARTERIAL PRESSURE OF NARCOTIZED DOGS. — School of Aviation Medicine, Randolph Field, Tex. April 1952. iii+11 p. (Project no. 21-26-003, Report no. 2; TIP U22323).
PB 106873

The effects of breathing mixtures containing 8.5 to 0 per cent oxygen on the heart rate, respiratory rate, femoral arterial pressure, and pulmonary arterial pressure of the intact, closed-chested, narcotized dog were compared. Mixtures containing 8.5 per cent oxygen failed to significantly elevate pulmonary arterial pressures under the experimental conditions used, but 5.8 per cent oxygen did produce such increases in 3 animals. Breathing an oxygen-free atmosphere until apnea occurred produced alterations in pulmonary arterial pressure which were qualitatively different from those occurring in systemic arteries. (School of Aviation Medicine abstract)

Beard, M. G. 1952
COCKPIT INSTRUMENT PANELS STANDARDIZED. — SAE Jour., 60 (6): 50-51. 1952.
DLC (TL1.S5, v. 60)

A plan is being worked out by the Cockpit Standardization Committee of the Society of Automotive Engineers (SAE) to standardize cockpit instrument panel layouts for commercial airplanes. The basic layout of instruments, (which is to adhere as closely as possible to the arrangement now customary in most airplanes) will be incorporated in a number of modified patterns to include various recently developed computer instruments. The following guiding principles were adopted: (1) the basic six instruments should be grouped together; (2) the directional gyro and the gyro horizon should be placed in the center; (3) directional instruments should be placed in a vertical line; (4) altitude instruments should be arranged horizontally; and (5) closely related instruments should be placed as close together as possible.

Beck, G. J., 1952
H. E. Seanor, A. L. Barach, and D. Gates
EFFECTS OF PRESSURE BREATHING ON VENOUS PRESSURE; A COMPARATIVE STUDY OF POSITIVE PRESSURE APPLIED TO THE UPPER RESPIRATORY PASSAGEWAY AND NEGATIVE PRESSURE TO THE BODY OF NORMAL INDIVIDUALS. — Amer. Jour. Med. Sci., 224 (2): 169-174. 1952.
DSG

Venous pressure responses of humans were measured during artificial respiration produced by positive pressure from masks or domes. A comparison was made with the effects of negative pressure in a conventional tank respirator. Rise of venous pressure and other circulatory effects were found to be similar in all three methods and to be directly proportional to the mean pressure applied.

Beckman, E. L. see Duane, T. D., 1952, 1952a, 1952b

Bederede, J. L. see Biget, P. L., 1952

Bedwell, M. E. 1952
and W. G. Glendinning
MEASUREMENT OF THE MOISTURE CONTENT OF HIGH PRESSURE OXYGEN FOR USE IN AIRCRAFT. II. A HIGH PRESSURE HYGROMETER. — Royal Aircraft Establishment (Gt. Brit.), Farnborough. Tech. Note no. Chem. 1175, May 1952. 14 p., 4 plates. (ATI 164 853).
UNCLASSIFIED

The gas flow bridge principle has been used in designing an all-metal hygrometer to measure the moisture content of oxygen gas at transport cylinder pressure. The method could be applied to a producing plant, to give a warning if the moisture content of the gas exceeded the maximum permitted in the specification. Both glass-capillary and metal-capillary bridges have given satisfactory results at pressures approaching that of the atmosphere. A magnetically-operated pressure sensitive device has been made to function at the pressure-differential available, but would not operate in the bridge because of slight gas-leakage past the float, which upset the bridge off-balance. (Authors' summary)

Bedwell, M. E. 1952a
and W. G. Glendinning
MEASUREMENT OF THE MOISTURE CONTENT OF HIGH PRESSURE OXYGEN FOR USE IN AIRCRAFT. I. A LOW PRESSURE HYGROMETER. — Royal Aircraft Establishment (Gt. Brit.). RAE Tech. Note no. Chem. 1154, March 1952. 9 p. DN-Aer (T.I. no. 57647)
UNCLASSIFIED

A hygrometer has been devised which will give precise measurements of the moisture content of oxygen issuing from a cylinder. Test runs on samples from transport cylinders indicated that in every case the oxygen contained considerably less than the maximum amount of moisture allowed by specifications. No anomalous changes of moisture content with decreasing pressure were observed in the cylinders selected [for use on airplanes]. (Authors' summary)

Békésy, G. von 1952
GROSS LOCALIZATION OF THE PLACE OF ORIGIN OF THE COCHLEAR MICROPHONICS. — Harvard Univ. Psycho-Acoustic Lab., Cambridge, Mass. Report no. PNR-127, [1952]. 30 p., 18 plates (Contract N5ori-76, Task order 2; TIP U22332).
UNCLASSIFIED

An apparatus was developed that made it possible to push an electrode automatically with an absolutely even and smooth velocity through the cochlear partition of an anesthetized guinea pig.

The a.c. and d.c. potentials of this perforating electrode were recorded during the perforation when sound was applied to the eardrum, or an electrical generator was connected to the vestibular and tympanic channel of the cochlea. These measurements enable us to show that the endolymph is surrounded by an electrically insulating layer, and that the inner part of the organ of Corti is protected from external electrical potential fields. Further it was shown that the microphonics produced by a vibration of the eardrum have larger values inside the endolymph than in the perilymph or near the round window. The microphonics seem to reach a maximum near the organ of Corti.

The perforation measurements also made it possible to discriminate three types of tissues in the cochlea: (1) highly sensitive cells with large microphonics and d.c. potentials; (2) cells that do not produce large microphonics but still have in them large d.c. potentials; and (3) tissues that are electrically indifferent and can be represented by an electric resistance. These distinctions and the measurement of the electric conductivity of the endolymph permit a coarse description of the electro-anatomy of the cochlear partition. (Author's abstract)

Beltran, L. 1952
[MAN AND WIND] El hombre y el viento. — Medicamenta (Madrid), 10 (212): 73-75. 1952. In Spanish.
DSG (W1 ME5494, v. 10)

Human reactions to wind can be grouped as follows: (1) Sympatheticotonics are usually very active people, with high nervous tension, becoming irritated over insignificant things. (2) Vagotonics are very sensitive especially to the West wind [in Spain] which quiets them even more, and have a tendency to melancholy and selfpity; vagotonics incline to obesity and low arterial pressure (3) Subjects with an unstable nervous system make up the third category; in these subjects certain symptoms such as irritability, anxiety, and lack of sleep appear while the wind is blowing but disappear as soon as the wind is over. Among pathological conditions, pulmonary lesions in tuberculosis, asthma, kidney ailments, and various psychiatric conditions seem to be aggravated under the effect of the wind.

Beman, F. M. see Kemph, J. P., 1952a

Benchimol, R. 1952
[INTRODUCTION TO ORTHOPTICS; HETEROPHORIAS] Introducção a ortóptica; heteroforias. Revista médica da aeronáutica (Rio de Janeiro), 4 (3); 81-92. 1952. In Portuguese.
DSG (W1 RE609, v. 4)

A brief analysis is given of the deficiencies of binocular vision and the terminology of heterophorias is discussed. The author distinguishes horizontal deviations (esophoria or exophoria), vertical deviations (right hyperphoria with left hypophoria and vice versa, and alternating hyperphoria), and rotational deviations (positive and negative cyclophoria). The examination methods of all heterophorias are based on the temporary suppression of binocular vision. Distinction should be made between heterophoria and strabismus; once the binocular balance is disturbed, heterophoria can easily turn into strabismus. Etiology, symptomatology, and orthoptic treatment are discussed.

Benchimol, R. 1952a
[CAUSES OF DISQUALIFICATION IN THE OPHTHALMOLOGICAL SELECTION OF AIR CADETS] Causas de incapacidade na selecção oftalmológica dos cadetes do ar. — Revista médica da aeronáutica (Rio de Janeiro), 4 (4): 71-76. 1952. In Portuguese. DSG (W1 RE609, v. 4)

Ophthalmological examination carried out on 210 Brazilian military aviation candidates, 16-20 years of age, gave the following results: there were 17 cases of refractive error, 10 candidates were color blind, and in 8 cadets severe heterophorias were present. Furthermore, there was lack of accomodation in 8 cases, deficiency in convergence in 3, chorioretinal atrophy in 3, coralliform cataract in 1, and bilateral papillary edema in 1 case. 46 of the 210 candidates were rejected for ophthalmological reasons.

Benchimol, R. 1952b
and Sébas, R.
[THE HUMAN EYE AT HIGH SPEEDS] O ôlho humano nas altas velocidades. — Revista médica da aeronáutica (Rio de Janeiro), 4 (2): 113-118. 1952. In Portuguese. DSG (W1 RE609, v. 4)

High altitude flight involves various problems concerning the human eye. In flight at supersonic speed, a compressed air wave precedes the plane, which disturbs visibility; any visual deficiency of the pilot would become aggravated during high-speed flight. — In space flight, the vibration of the engine may have a certain inhibitory effect on visibility. — The delay in visual perception, i.e., the time between stimulation and perception, varies between 35 and 150 milliseconds, and thus induces a latent scotomic perception period. This phenomenon may be responsible for certain accidents. — Another limiting factor of vision is the environmental temperature. When a plane is flying at 2000 miles per hour, the temperature on the surface of the plane is nearly 600°C.; the human eye can tolerate 110°C. for about 23 minutes. — Visual tolerance in bailout has not yet been determined, but, above a speed of 530 miles per hour, the facial tissues are presumably liable to rupture.

Benchimol, R. 1952c
[STANDARDIZATION OF PHOROMETRY] A padronização da forometria. — Revista médica da aeronáutica (Rio de Janeiro), 4 (2): 123-126. 1952. In Portuguese. DSG (W1 RE609, v. 4)

Phorometric tests were carried out on 100 pilots in order to ascertain the most effective testing conditions. The best results were obtained by applying the Maddox rods and the Risley prism to the non-dominant eye. It is very difficult to de-

termine to what degree heterophorias interfere with the normal function of the eyes. One eye may easily compensate for the deficiency of the other. Precise phorometric examinations should be included in the pilot selection tests.

Benchimol, R. 1952d
[CAUSES OF DISQUALIFICATION IN THE OPHTHALMOLOGICAL SELECTION OF AIR CADETS] Causas de incapacidade na selecção oftalmológica dos cadetes do ar. — Imprensa médica (Rio de Janeiro), 28 (457): 87-91. 1952. In Portuguese. DSG

Same as the paper, Benchimol, R., 1952a.

Benchimol, R. 1952e
[LIGHT SENSE AND ANOXEMIA] Senso luminoso e anoxemia. — Revista médica de aeronáutica (Rio de Janeiro), 4 (4): 77-82. 1952. In Portuguese. DGS (W1 RE609, v. 4)

The effects of anoxemia on the progress of dark adaptation were studied on 10 aviation cadets by means of a biophotometer. The normal adaptation curve was obtained by measuring the visual thresholds of the subjects at regular intervals after they had looked at a brightly illuminated screen. Experiments in the decompression chamber, at simulated altitudes of 10,000, 15,000, and 20,000 feet, showed that the thresholds increased with the decrease in oxygen tension. After inhalation of oxygen, the thresholds returned to their normal values. Anoxemia produces also a narrowing of the visual field and a decline of the visual acuity. The possible mechanisms involved in the effects of anoxemia on vision are discussed.

Benchimol, R. see also Sébas, R., 1952

Bénitte, A. C. 1952
[MOTION SICKNESS] Le mal des transports. — Bulletin international des services de santé des armées de terre, de mer et de l'air (Liège), 25 (6): 235-249. 1952. In French, with English summary (p. 248). DSG (W1 BU666, v. 25)

Contrary to popular belief, proneness to motion sickness is almost universal. Estimates vary between 90 and 100%. Adaptation to travel motion is, however, possible in 95-98% of all cases. The author discusses briefly the etiology of motion sickness, emphasizing the supplementary effects of visual and kinesthetic stimulation and stressing the role of psychological factors. Dietary restrictions are of no avail. Psychotherapy may be advisable in extreme cases. Dramamine, Nautamine, Antistine, Benadryl, and Phenergan have been used with favorable results. However, hypnogenic side-effects render these drugs unsatisfactory, particularly when used during military operations. Lisergan, developed in France, is practically free of hypnogenic effects, while still strong in antihistaminic and antisynaptic properties.

Bénitte, A. C. 1952a
[MOTION SICKNESS] Le mal des transports. — Science et vie (Paris), 82 (419): 101-104. 1952. In French. DLC (T2.S3, v. 82)

A brief popular outline is presented of the causes, physiology, prophylaxis, and treatment of motion sickness.

Benson, O. O. see Boothby, W. M., 1952; White, C. S., 1952b
Beranek, L. L. see Bolt, R. H., 1952

Berg, P. 1952
NAVY'S NEW RESCUE COLOR. — Pictures (St. Louis Post-Dispatch), March 9, 1952: 1. 1952. DLC

This article, illustrated in color, outlines the tests carried out by Commander Dean Farnsworth at the Medical Research Laboratory, New London, Conn., on the visibility of rescue equipment at sea. Red was found to be the most efficient color for distant visibility and superior to yellow which, in distant view, merges with the blue of the sea to a grayish tone. A strong reddish orange, known as international or Indian orange, used by the Coast Guard as a color for lifeboats and jackets was considered too dark under most atmospheric conditions at sea. Fluorescent colors are counted out because of their poor stability.

Bergeret, P. 1952
[THE HUMAN FACTOR IN JET PLANE ACCIDENTS IN 1951] Le facteur humain dans les accidents d'avions à réaction en 1951. — Médecine aéronautique (Paris), 7 (2): 181-185. 1952. In French.
DLC (TL555.M394, v. 7)

The factors underlying the 40 jet plane accidents (Vampire and F84) which occurred in 1951 were analyzed from medical questionnaires. Of 40 accidents, 10 were definitely due to material defects and 3 to undetermined causes. In the remaining 27 accidents, the human element, lack of attention or lack of judgement, was responsible. Besides physiological factors (sinusitis accompanied by nasal hemorrhage, anoxemic syncope, sweating, feeling of weakness), psychological factors, generally less common in propeller-driven airplane accidents, were involved. Modern pilots have to be treated as sportsmen making special efforts to achieve a good performance day by day. It is the duty of the flight surgeon to make sure that each pilot is in the proper physiological and psychological condition.

Berkeley, M. H. 1952
and G. A. Yourick
THE DEVELOPMENT OF AN ATTITUDE SURVEY FROM FIVE EXISTENT FORMS. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. PERS 52-54, Dec. 1952. 6 p. (Project no. 503-002-0007; AD 8134).
UNCLASSIFIED

In previous studies attitude survey forms and keys had been developed which measure "the general attitude toward military service". The reliability of these tests rates higher for flyers than for officers. Greater reliability was obtained with revised forms which are worded in such a way that they can be administered to any male military group.

Berkowitz, L. 1952
GROUP NORMS AND THE READINESS OF AIRCREWS TO COMPLETE TRAINING MISSIONS. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. CCT 52-2, Dec. 1952. 9 p. (Project no. 511-023-0002; AD 145). UNCLASSIFIED

Two classes of student bomber crews were used to test the hypothesis that crews having a group norm favorable to the Air Force will tend to have fewer noncompleted training missions than those crews not having such a shared attitude or having a group norm unfavorable to the Air Force. The measures of norms employed were: (a) agreement among crew members that other crew members would get their jobs done as well as possible, and (b) agreement among crew members in scores on a scale measuring confi dence in Air Force management. For both measures there was a negative relationship with the incidence of noncompleted training missions. Evidence suggests that consideration of crew cohesiveness may help to strengthen the relationships and to provide a basis for refining the measures of norm. (AD abstract)

Berkshire, J. R. see Richey, H. W., 1952
Berlin, N. I. see Fryers, G. R., 1952a

Berry, L. J., 1952
R. B. Mitchell and D. Rubinstein
THE INFLUENCE OF POLYCYTHEMIA PRODUCED AT HIGH ALTITUDE ON RESISTANCE TO INFECTION. VI. THE RESPONSE TO INFLUENZA A VIRUS INFECTION. — July 1952. iii+6 p. Bryn Mawr Coll., Pa. (Contract AF 33(038)-17842); and School of Aviation Medicine, Randolph Field, Tex. (Project no. 21-35-005, Report no. 6) (TIP U23252). PB 107153

The LD50 dosage of Influenza A virus was calculated for the following groups of mice: (A) those made polycythemic by exposure to a simulated altitude of 15,000 to 20,000 ft. and then allowed to recover one day before infection; (B) those similarly exposed, but allowed recovery for 3 weeks prior to infection; (C) those made anemic by standardized hemorrhage; and (D) normal mice. The results, given in terms of titers (exponents of reciprocals of the dilutions), were 6.00 for group A, 5.56 for B, and 6.38 each for groups C and D. The difference between the titers for groups B and D means that about 7 times the amount of virus is required to kill the control mice. Although the data indicate that group-B mice are most resistant, followed in order by groups A, C, and D, the statistical significance of the figures is still in question. (TIP abstract)

Berry, L. J. 1952a
and R. B. Mitchell
INFLUENCE OF ACCLIMATIZATION TO ALTITUDE ON SUSCEPTIBILITY TO INTRASTOMACHAL INFECTION WITH SALMONELLA TYPHIMURIUM. — Nov. 1952. 5 p. Bryn Mawr Coll., Pa. (Contract AF 33(038)-17842); and School of Aviation Medicine, Randolph Field, Tex. (Project no. 21-35-005, Report no. 7) (TIP U25752 and ATI 188 460). PB 108192

Four groups of mice were used in this experiment: (1) mice adapted to simulated high altitude (15,000-20,000 feet) for three weeks and given one day at normal atmospheric pressure before being infected; (2) mice subjected to nine hemorrhages and infected one day after the last bleeding; ings: (3) mice subjected to high altitude immediately following infection; and (4) untreated mice (controls). The mice were infected intrastomachally with Salmonella typhimurium. Group (3) was more susceptible than the controls. The anemic mice (2) and those adapted to altitude prior to infection (3) showed greater immediate resistance, but their final mortality was not significantly different from that of the controls. (TIP abstract, modified)

Berry, L. J. 1952b
and R. B. Mitchell
THE EFFECT OF IMMUNIZATION AND OF RETICULOENDOTHELIAL BLOCKAGE ON SUSCEPTIBILITY IN MICE ACCLIMATIZED TO ALTITUDE TO SALMONELLA TYPHIMURIUM INFECTIONS. — Nov. 1952. 7 p. Bryn Mawr Coll., Pa. (Contract AF 33(038)-17842); and School of Aviation Medicine, Randolph Field, Tex. (Project no. 21-35-005, Report no. 8) (TIP U25753 and ATI 188 459). PB 108193

Mice adapted to altitude for three weeks are more susceptible to intraperitoneal infection with Salmonella typhimurium than control mice. This relationship between the two groups of mice holds in such a way that the same difference in mortality is observed when all animals are (a) immunized, (b) injected intravenously with thorotrast so as to block the reticuloendothelial system, or (c) infected without additional treatment, as seen in earlier work. Similarly, mice subjected to altitude throughout the post-infection period become more susceptible than control mice to the mouse typhoid after about one week even though both groups are previously (a) immunized or (b) injected with thorotrast. Anemic mice, as former reports have shown, are more resistant than control mice to S. typhimurium infection, but when their response is compared to that of controls after all animals are immunized or injected with thorotrast, it is found that the anemic mice are more susceptible. These results support the hypothesis that neither the cellular nor the immune defense mechanisms are directly involved in the

changes in resistance to infection observed in animals subjected to the stress of altitude or of blood loss. (Authors' summary)

Besnard, G. G. 1952
DEVELOPMENT OF A CHECK LIST TO STUDY JOB TASKS PERFORMED BY B-29 AIRPLANE AND ENGINE MECHANICS. — Air Training Command. Human Resources Research Center. Technical Training Research Lab., Chanute Air Force Base, Ill. Research bulletin no. 52-31, Nov. 1952. v+12 p. (Project no. 507-012-0003; AD 1101). PB 108527

A check list containing 186 job tasks was developed for use in studying the clustering of tasks performed by airplane and engine mechanics when working on B-29 aircraft. The check list is to be administered to job incumbents and checked by their immediate supervisors. In case of disagreement on level of performance for any task, the supervisor's response will be used. Preliminary data resulting from the initial use of the check list are presented and interpreted to show how the list was used to classify the tasks into 3 levels of skills. (AD abstract)

Bethurum, J. L. see Payne, B. A., 1952

Beyne, J. 1952
[PRECISE EVALUATION OF THE VISUAL FITNESS OF AVIATORS; PRESENTATION OF INSTRUMENTS: OPTOMETER AND SCOTOPTOMETER] Evaluation précise des aptitudes visuelles chez l'aviateur. Présentation d'appareillages: optomètre et scotoptomètre. — Médecine aéronautique (Paris), 7 (4): 395-398. 1952. In French.
DLC (TL555.M394, v. 7)

Methods utilized in the measurement of visual acuity and form distinction in aircrew personnel are discussed; the application of the optometer and of the scotoptometer is described in detail.

Beyne, J. 1952a
[VISION IN THE DARK OR SCOTOPIC VISION AND ITS EVALUATION] La vision en milieu obscur ou vision scotopique et ses procédés d'évaluation. — Médecine aéronautique (Paris), 7 (3): 219-235. 1952. In French.
DLC (TL555.M394, v. 7)

Scotopic vision is effected by the retinal rods; it is vision without color, induced by the luminous excitation of the parafoveal and perifoveal areas of the retina. This vision is characterized by three features: dark adaptation (increase in retinal sensitivity and decrease of the light perception threshold); the Purkinje phenomenon (displacement of retinal sensitivity toward the blue end of the spectrum); and scotopic myopia (i.e. the fact that the image is formed in front of the retina and no accomodation takes place beyond 70-80 centimeters). The effectiveness of scotopic vision depends on the amount of light, the dimensions of the target object, and the contrast between the background and the object. — With regard to pilot selection for night combat the following factors are of importance: Evaluation of the scotopic vision, both in terms of refractive properties of the eye and the ability to interpret shapes; classification of pilots according to their visual efficiency; protection of the eye from glaring lights with special glasses during the day; and special night vision training.

Biel, W. C., 1952
G. A. Eckstrand, A. D. Swain, and A. N. Chambers
TACTUAL DISCRIMINABILITY OF TWO KNOB SHAPES AS A FUNCTION OF THEIR SIZE. — Jan. 1952. iii+14 p. Ohio State Univ., Columbus (Contract AF 33(038)-15474); and Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. Technical report no. 52-7 (RDO no. 694-17) (TIP U23385). PB 107252

Five groups of 20 subjects each, wearing a medium-weight flying glove, attempted to discriminate tactually between wheel and flap control knobs. The subjects were allowed to view the knob shape for about 2 sec. prior to performing the task. The major dimension of the 5 test knob sizes was varied in 1/4-in. steps from 1 through 2 in. Each subject made 48 discriminations. Analyses were made of the number of initially correct responses, average response times for initially correct responses, and average time required to make 48 correct responses. No significant differences were noted between the knob sizes. (TIP abstract)

Biget, P. 1952
[THE OXYPHORIC CAPACITY OF THE BLOOD] Le pouvoir oxyphorique du sang. — Médecine aéronautique (Paris), 7 (3): 251-265. 1952. In French.
DLC (TL555.M394, v. 7)

The oxygen content of the blood was determined by three different apparatus (Barcroft, Haldane, and Van Slyke), all giving similar results. As either anemia or imperfect fixation of oxygen to hemoglobin might affect the oxyphoric capacity of the blood, its iron content was determined at the same time. While in most of the subjects tested a parallelism prevailed between the oxyphoric capacity and iron content of the blood, in certain individuals the oxyphoric capacity fluctuated. — In the selection of pilot candidates it should be remembered that the fixation of oxygen to hemoglobin depends on the partial pressure of this gas in the air; if the blood has a low oxygen fixation rate on the ground, this rate will only decrease at altitude.

Biget, P. see also Tabusse, L., 1952, 1952b

Biget, P. L. 1952
and J. L. Bederede
[EFFECT OF SOME DRUGS USED IN THE PREVENTION OF MOTION SICKNESS ON THE PSEUDOCHOLINESTERASE ACTIVITY OF THE SERUM IN MAN AND IN THE ANIMAL IN VIVO AND IN VITRO] Action de quelques drogues utilisées pour la prévention du mal des transports sur l'activité pseudo-cholinestérasique du serum chez l'homme et chez l'animal in vivo et in vitro. — Médecine aéronautique (Paris), 7 (4): 467-469. 1952. In French. DLC (TL555.M394, v. 7)

The effects of motion-sickness remedies on serum cholinesterase activity were studied in vitro and in vivo. Samples of serum to which the preparations "4181 RP" or "4260 RP" had been added showed less cholinesterase activity than did untreated sera. The in vivo experiments were performed on persons and dogs. Administration of Nautamine, Thephorine, or Dramamine reduced the cholinesterase level of the blood. It is well known that motion-sickness proneness is found most commonly in a group of people called vagotonics, who also have a low level of blood cholinesterase. The cholinesterase deficiency has been thought to be one of the causes of motion-sickness predisposition. In the light of the experiment described this hypothesis is no longer tenable.

Bijout, R. 1952
[AERIAL WAR AND MEDICAL SERVICES] Guere aérienne et service de santé. — Médecine aéronautique 7 (1): 39-59. 1952. In French. DLC (TL555.M394, v. 7)

Definition, organization, and tasks of the French military medical services are discussed in detail with regard to aerial warfare. The good functioning of such an organization depends on the methodical, objective, and practical utilization of available medical resources, and a familiarity with scientific and technical developments.

Bilodeau, E. A. 1952
SOME EFFECTS OF MODIFICATION OF INFORMATION ABOUT A PREVIOUS RESPONSE UPON THE ACQUISITION OF TWO LEVER POSITIONING HABITS. — Air Training Command. Human Resources Research Center. Perceptual and Motor Skills Research Lab., Lackland Air Force Base, Tex. Research bulletin no. 52-1, Jan. 1952. 7 p. (Project no. 509-021-0001; TIP U21635). PB 106662

Data were obtained on the ability of subjects to learn two different lever-positioning habits when these habits were practiced in alternation. The subjects matched the height of a moving green light to that of a fixed red light by pulling a lever a certain distance. The task was performed in 8 blocks of 5 trials each; on alternate blocks the lever position required to achieve the match was changed, unknown to the subjects. The amount of change was different for 4 groups of 40 men. The results indicated that when the lever distance was changed by the tester, the subjects altered their lever-positioning habits even though they had no information regarding the change. Performance during the blocks of trials when the lever distance remained unchanged showed improvement. Performance in learning the modified distance did not show improvement, suggesting that the original and interspersed training of the original response decreased the rate at which learning took place under the modified condition. (TIP abstract)

Bilodeau, E. A. 1952a
A FURTHER STUDY OF THE EFFECTS OF TARGET SIZE AND GOAL ATTAINMENT UPON THE DEVELOPMENT OF RESPONSE ACCURACY. — Human Resources Research Center. Perceptual and Motor Skills Research Lab., Lackland Air Force Base, Tex. Research bulletin no. 52-7, Feb. 1952. v+5 p. (Project no. 509-020-0007; TIP U21931). PB 106752

The effects of variations in target size on the accuracy of positioning a lever were investigated in experiments with 3 groups of 49 subjects each. The target consisted of a column of red lamps, of which 1 to 3 were lighted, thus providing for smaller and larger "target sizes". The test subject was required to "hit" the target several times by moving a lever on a trial and error basis. The outcome of each endeavor was reported (after a 5-second delay) by a green light on a column parallel to the target column. The outcome of the experiment led to the following conclusions: (1) it seems likely that the acquisition of motor skill is somehow regulated by knowledge of results; (2) feedback information with respect to incorrect and partially incorrect responses is probably of more consequence than cues from what the subject consideres to be a perfect response; (3) target dimensions appear to be of less importance than is generally assumed; and (4) motivational factors may come into play in connection with target size; very small targets may have a discouraging effect, while large targets may induce a response of remaining on the target rather than one of reducing the discrepancy between the initial response and the target center. (TIP abstract)

Bilodeau, E. A. 1952b
SPEED OF ACQUIRING A SIMPLE MOTOR RESPONSE AS A FUNCTION OF SYSTEMATIC TRANSFORMATIONS IN KNOWLEDGE OF RESULTS. — Air Training Command. Human Resources Research Center. Perceptual and Motor Skills Research Lab., Lackland Air Force Base, Tex. Research bull. no. 52-33, Nov. 1952. v+22 p. (Project no. 509-020-0007; AD 3773). PB 108823

The types of learning situations and the variations in providing "knowledge of results" which will contribute to optimum learning conditions were studied. The problem consisted of turning a micrometer knob to achieve a reading of 200 on the micrometer scale. Although the micrometer

scale was hidden from view, the airmen serving as subjects were told the reading on the scale achieved through their turning of the micrometer knob. The micrometer readings reported to one group of airmen after each trial were the correct readings. In 4 other groups, erroneous information was provided regarding the extent to which the obtained score differed from the goal score of 200. For each of the 4 groups a different sliding scale was employed, although the conversion between true score and reported score was such that an obtained score of 200 was reported as 200. Five seconds after responding, subjects received a score according to the schedule $Y = aX+b$, where Y represents reported score; X, true score; and a and b transformation constants. The results indicated that, initially, learning of the task was more rapid in the group given accurate knowledge of results information. The rate of initial learning was associated with the relative incorrectness of knowledge of results reported. (AD abstract, modified)

Bilodeau, E. A. 1952c
A PRELIMINARY STUDY OF THE EFFECTS OF REPORTING GOALS AS A FUNCTION OF DIFFERENT DEGREES OF RESPONSE ACCURACY. — Air Training Command. Human Resources Research Center. Perceptual and Motor Skills Research Lab., Lackland Air Force Base, Tex. Research Bulletin no. 52-4, Jan. 1952. v+5 p. (Project no. 509-020-0007; TIP U21897)
PB 106749

Three groups of 96 airmen each were trained to position a lever to obtain a match on a visual display panel. The apparatus consisted of two parallel columns of lamps mounted on the panel. A green light in one column was moved up and down by moving a control stick. The subject's task was to move the green light to match a red light in the other column. The subject, who could not see the light move, moved the control stick to the position he judged to be correct. The green light lighted 5 sec. after the movement. Training of the groups differed in the amount of tolerance in control-stick movement allowed in indicating a match. All groups were given 12 training trials, followed by 8 test trials. The tolerance for all groups during the test trials was the same as that for the group having the least tolerance during the training trials. During the test trials there was little difference between the average performance of men trained with large tolerance and men trained with no tolerance. (TIP abstract)

Bilodeau, E. A. 1952d
MASSING AND SPACING PHENOMENA AS A FUNCTION OF PROLONGED AND EXTENDED PRACTICE. — Air Training Command. Human Resources Research Center. Personnel Research Lab., Lackland Air Force Base, Tex. Research bulletin no. 52-9, Feb. 1952. v+6 p. (Project no. 509-020-0002; TIP U21977). PB 106770

Two groups of subjects practiced cranking as fast as possible for eight minutes on each of ten successive week-days. For the spaced practice group a rest of four minutes was interpolated between two practice periods of four minutes. The massed practice group cranked continuously for the entire eight minutes. The data were presented as mean number of revolutions per successive 20-second scoring periods on each day of practice. Continuous cranking led to marked decrements in rate of response during each experimental session. The major findings are: The initial rate of responding for each day decreased significantly but by a small amount as a function of days of practice. There appeared to be no difference as a function of spacing of prior practice. —Rate of responding at four or eight minutes was an increasing function of days of practice. The difference between the groups at eight minutes was attributable to the preceding four minute rest period. — The level to which the spaced practice group recovered after four minutes of rest remained invariant over days. — The amount of 24-hour spontaneous recovery decreased as a function of days for both massed and spaced practice groups. The difference between the groups was related to the difference in terminal rate of responding of the preceding day. — Four-minute spontaneous recovery for the spaced practice group decreased as a function of days. This decrease appears related to the increasing response rate immediately prior to rest. (From the author's summary)

Bilodeau, E. A. 1952e
TRANSFER OF TRAINING BETWEEN TASKS DIFFERING IN DEGREE OF PHYSICAL RESTRICTION OF IMPRECISE RESPONSES. — Air Training Command. Human Resources Research Center. Perceptual and Motor Skills Research Lab., Lackland Air Force Base, Tex. Research bulletin no. 52-40, Dec. 1952. 15 p. (Project no. 509-020-0001; AD 3257).
UNCLASSIFIED

Two units of the two-hand coordination test were modified by substituting a vertically mounted pin for the usual tracking contact and a stationary cloverlike path for the usual moving-target button. On one unit, the path (T) was walled to restrict improper responses, while the path (F) on the other was not. Four groups totaling 304 airmen were tested. Each subject moved the pin over the path as fast as possible during successive with T then with F; a second practiced first with F then with T. The third and fourth (control) groups practiced with T or F throughout. Results showed statistically significant amounts of transfer between tasks. (AD abstract)

Bilodeau, E. A. see also Jones, Earl I., 1952
Bilodeau, I. M. see Reynolds, B., 1952; Reynolds, J. B., 1952

Binet, L. 1952
and M. V. Strumza
[HYPOXIA, HYPEROXIA, AND THE INTELLECTUAL ABILITIES OF THE NORMAL MAN] Hypoxie, hyperoxie et facultés intellectuelles de l'homme normal. — Médecine aéronautique (Paris), 7 (4): 516-518. 1952. In French. DLC (TL555. M394, v. 7)

A total of 112 subjects were divided into pairs of similar intelligence levels, one of them breathing pure oxygen at atmospheric pressure, the other inhaling a gas mixture inducing anoxemia; at the same time, both were subjected to an intelligence test. Inhaling pure oxygen for more than 20 minutes had an unfavorable effect on intellectual performance. Breathing air with an oxygen content of 16.4% induced at first disturbances, which were, however, corrected within 10 minutes; there were some individual variations in the response to hypoxia.

Binet, L. 1952a
and M. V. Strumza
[SYNTHETIC ANTIHISTAMINICS AND DURATION OF RESPIRATORY RESISTANCE TO ANOXIA] Antihistaminiques de synthèse et durée de résistance respiratoire à l'anoxie. —Médecine aéronautique (Paris), 7 (4): 534-537. 1952. In French. DLC (TL555. M394, v. 7)

Chloralosed dogs were subjected to anoxia by breathing either oxygen-deficient (2.5%) air or pure nitrogen until respiratory movements ceased. After resuscitation of the animals (either spontaneously or by artificial respiration), antihistaminic drugs were administered and the experiment was repeated. In the animals breathing oxygen-deficient air, the duration of breathing movements was shortened (191.6 seconds, compared with 251.3 seconds before the antihistaminics); in animals breathing nitrogen, however, the breathing phase was prolonged (108.5 seconds vs. 89.5 seconds). Administration of antihistaminics resulted in lowered arterial pressure and in the abolishment of the hypertension which normally precedes the onset of apnea.

Binet, L., 1952b
M. V. Strumza, and Strumza-Poutonnet
[HYPOXIC HYPERPNEA AND CARBON DIOXIDE] Hyperpnée hypoxique et anhydride carbonique. — Journal de physiologie (Paris), 44 (2): 215-217. 1952. In French. DSG

The respiratory volume of normal chloralozed and vagotomized dogs in various states of hypoxia and hypercapnia was measured. Either lack of oxygen or excess of CO_2 were found to induce hyperpnea. Hypoxia did, however, not increase the effect of CO_2. Hyperpnea caused by hypercapnia remained at a constant level throughout the experiment (i.e. for 10 minutes), while hyperpnea caused by O_2 deficiency increased during the first 2 minutes, then decreased rapidly, and became stabilized after 10 minutes. On the basis of the experimental findings, the assumption that hypoxia sensitizes the respiratory centers for CO_2 appears to be refuted.

Binet, L., 1952c
M. V. Strumza, and J. Levy
[THE EFFECT OF MODERATE HYPOXIA ON THE INTELLECTUAL PERFORMANCE OF MAN] Effet d'une hypoxie modérée sur les facultés intellectuelles de l'homme. — Comptes rendus de l'Académie des sciences (Paris), 235 (3): 219-222. 1952. In French. DSG

Essentially the same as the paper, Binet, L., 1952.

Bitterman, M. E. 1952
and W. H. Holtzman
DEVELOPMENT OF PSYCHIATRIC SCREENING OF FLYING PERSONNEL. III. CONDITIONING AND EXTINCTION OF THE GALVANIC SKIN RESPONSE IN RELATION TO CLINICAL EVIDENCE OF ANXIETY. — Jan. 1952. iii+16 p. Univ. of Texas, Austin (Contract AF 33(038)-13887); and School of Aviation Medicine, Randolph Field, Tex. (Project no. 21-37-002, Report no. 3) (TIP U22054). PB 108740

Thirty-seven university men chosen at random from a list of volunteers were rated for susceptibility to anxiety, on the basis of psychometric indices and performance in a laboratory stress situation, and then divided into two groups with respect to that criterion. The galvanic skin response to shock conditioned more readily and extinguished less readily in the high anxiety group than in the low. In view of the homogeneity of the sample and the limited and relatively unreliable criterion employed, this experiment represents a most severe test of the hypothesis that anxiety and behavior in conditioning situations are significantly related. The positive results obtained under these circumstances suggest that a more extensive field investigation of the applicability of conditioning procedures of the psychiatric screening of military personnel might be undertaken with profit. (Author's abstract)

Bitterman, M. E. see also Holtzman, W. H., 1952

[Bjuggren, B.] 1952
[CRASH STATISTICS IN THE AIR FORCE WITH SPECIAL REFERENCE TO THE "HUMAN FACTOR"] Haveristatistiken inom flygvapnet med speciell hänsyn till den "mänskliga factorn". — Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 1952 (3): 8-9. 1952. In Swedish. DSG

The flight accident rate in the Swedish air force has diminished 25% from 25 accidents (including minor ones) per 10,000 flying hours in 1950, to 18 in 1951. Fatal crashes have been reduced to 1.5 per 10,000 flying hours. Contrary to expectations, the accident rate is lower in jet

planes than in propeller-driven planes. Various accidents are briefly analyzed with special regard to human error. 7% of the crashes could be attributed to the human factor.

Bjurstedt, H. 1952
[THE NEW DIVISION OF AVIATION PHYSIOLOGY AT THE KAROLINSKA INSTITUTE]. Den nya avdelningen för flygfysiologi vid Karolinska Institutet. — Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 1952 (1): 11-13. 1952. In Swedish. DSG

In 1950 the Karolinska Institute (Stockholm) has received appropriations for the construction of a human centrifuge. Though not comparable in size and performance to its counterpart at the Naval Air Development Center at Johnsville, Pa., the centrifuge is among the first of its kind in Europe. A description of performance and specifications (cabin, arm, platform, suspension mechanism, and instrumentation) is presented. The centrifuge is capable of producing an accelerative force of 30 g.

Black, J. W. 1952
SOME PHYSIOLOGICAL ACCOMPANIMENTS OF SPEAKING. — April 1, 1952. 33 p. Ohio State University Research Foundation, Columbus (Contract N6onr-22525); issued by Naval School of Aviation Medicine, Pensacola, Fla. (Project report no. NM 001 064.01.10). Joint project report no. 10 (TIP U22355). PB 106938

(1) Loud speaking involves hyperventilation. The CO_2 content of alveolar gas is reduced during the speaking. The effects of nine minutes of loud reading upon the acid-base balance are not overcome in six minutes of rest. — (2) As a first approximation, the relationship between the volume of exhaled gas per unit of time and the sound pressure level (decibels) of a vowel-sound is apparently linear. — (3) Integrated values of the respiratory volume and the acoustic pressure that accompany the production of consonants and vowels show that: (a) the final consonant includes more acoustic pressure (and is longer) than the initial consonant; (b) saying vowels and consonants requires about the same amount of exhalation, while the vowels may contain several times as much acoustic pressure as the consonants; and (c) there are wide individual differences in the amount of gas exhaled by different speakers maintaining the same acoustic level of loud speech. (From the author's summary)

Black, J. W. see also Hall, F. G., 1952
Blair, J. T. see Maag, C. H., 1952

Blanc, E. 1952
[HOW THE EJECTION SEAT OF THE S.N.C.A.S.-O. WAS CONCEIVED AND PUT TO WORK] Comment fut conçu et mis au point le siège éjectable de la S.N.C.A.S.-O. — Ailes (Paris), 32 (1393): 5-6. Oct. 11, 1952. In French. DLC (TL502.A47, v. 32)

Experiments with ejection seats of the type Martin-Baker are described, carried out by the Société Nationale de Constructions Aéronautiques du Sud-Ouest (S.N.C.A.S.-O.). Difficulties were encountered in obtaining exact measurements of acceleration and displacement of different parts of the body in relation to the ejection seat (transmission of pressure waves within the human body). The head is accelerated twice the maximum seat acceleration. It is assumed, that in order to attain an acceleration of 20 g without danger of bodily injury, the maximum acceleration should be retarded at least one tenth of a second after firing the releasing mechanism. Proper cushioning is required to avoid dislocations of joints and tearing of ligaments, particularly in the spine. Ejections of test subjects were carried out, preceded by dummy experiments, at airplane speeds ranging from 174 to 496 miles per hour. In one instant only, the subject suffered a dislocated hip due to extreme slip-stream pressure.

Blanc, E. 1952a
[PASSAGE OF THE SOUND BARRIER PUTS A STRAIN ON THE PLANE... AND ON MAN LIKEWISE!] Le passage du "fossé" transsonique malmène l'avion... et l'homme aussi ! — Ailes (Paris), 32 (1395): 7. Oct. 25, 1952. In French. DLC (TL502.A47, v. 32)

In bailout from high-speed flight the danger of the legs of the flier being torn apart by the slip stream can be overcome by tying together the legs around the knees. At airplane speeds exceeding 155 miles per hour, the slipstream leads to deformation of the soft parts of the face, and causes a protrusion of the eye balls, congestion of the conjunctiva, and intense lachrymation. However, slip streams up to 300 miles per hour have been tolerated by certain subjects. Windtunnel experiments have shown that wind speeds above 500 miles per hour cause subcutaneous hemorrhages and tearing of ligaments. Flattening of the eye ball at a wind velocity beyond 300 miles per hour may have serious consequences. Shock waves encountered upon passing the supersonic "ditch" or "wall" are transmitted through the skull at amplitudes above 5/100 of a millimeter. Physiological implications of high-altitude flight (ultraviolet radiation, lack of light dispersion, etc.) are briefly discussed.

Blount, R. H. 1952
PERSONAL EQUIPMENT. — U. S. Air Force Medical Service Digest, 3 (9): 13-15. 1952. DSG (W2 A403u, v. 3)

Personal equipment at present in use by the U. S. Air Force or under development at the Aero Medical Laboratory (Wright-Patterson Air Force Base, Ohio) can be divided into two principal groups: (1) items which directly help the pilot or other crew members to accomplish their mission (e.g. anti-g suits, protective eyeglasses, oxygen masks, etc.), and (2) equipment designed to cope with emergency situations (e.g. exposure suits, crash helmets, survival kits, etc.). The

idea to integrate all emergency and protective features into one multipurpose garment was abandoned, since a situation hardly ever calls for all these features at the same time. The Laboratory is concerned with problems of cabin design, aiming at both comfort for the pilot and economy of space. The study of human tolerance to discomfort is of particular interest in view of the recent progress in long-range jet-fighter missions.

Bogaert, E. see Malmejac, J., 1952a

Boles Carenini, B. 1952
and V. Cima
[STUDY OF THE BEHAVIOR OF COLOR SENSITIVITY (RAYLEIGH'S EQUATION) BY NAGEL'S ANOMALOSCOPE DURING REDUCED OXYGEN SUPPLY TO THE EYE] Studii sul comportamento del senso cromatico (equazione di Rayleigh) all' anomaloscopio di Nagel sotto diminuito apporto di O_2 all' apparato oculare. — Rivista di medicina aeronautica (Roma), 15 (4): 527-542. 1952. In Italian, with English, French, Spanish, and German summaries (p. 540-542). DSG

Tests for color sensitivity (with Nagel's anomaloscope) were carried out on three groups of subjects. Twenty young subjects, Group I, inhaled a mixture poor in O_2, corresponding to an altitude of 6,000 meters. In Group II, comprising 30 subjects, compression of the eye ball induced local ocular hypoxia. Group III, about 30 subjects, serving as controls, first inhaled pure O_2 and then had pressure applied on the eye ball. Results of the tests were as follows: (1) general hypoxia induced abnormalities of color perception and aggravated existing abnormalities; (2) the inhalation of O_2 improved color sensitivity under normal atmospheric conditions; (3) pressure upon the eye ball induced an anomaly of the red-green chromatic perception; and (4) compression of the eye ball and inhalation of O_2 neutralized their mutually antagonistic effects.

Boles Carenini, B. see also Brognoli, C., 1952; Ferraris de Gaspare, P. F., 1952

Bolt, R. H., 1952
L. L. Beranek, and R. B. Newman
HANDBOOK OF ACOUSTIC NOISE CONTROL. I. PHYSICAL ACOUSTICS. — Dec. 1952. 397 p. Bolt, Beranek, and Newman, Cambridge, Mass. (Contract AF 33(038)-20572); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-204 (RDO no. 695-63) (AD 12 015). PB 111200

An over-all view is presented of the acoustic noise-control problem. The following noise source characteristics and methods of noise control are discussed: specification of a noise source, aircraft propellers and reciprocating engines, aircraft jet and rocket engines, fluid flow devices, industrial machine noise, physical characteristics of miscellaneous environmental noise, general noise-control planning, noise-control requirements, control of structure-borne noise, control of air-borne noise, rooms and special enclosures, and evaluation of sound-control installations. (AD abstract)

Bond, D. D. 1952
THE LOVE AND FEAR OF FLYING. — 190 p. New York: International Universities Press, 1952. DLC (RC1090. B6)

An extensive study of phobias and neuroses in combat pilots, based largely on the author's experience as a psychiatrist during World War II. The background and structure of psychiatric symptoms are analyzed in detail and documented by a great number of case histories. Therapeutic measures are indicated. The final chapters deal with the problematic position of a psychiatrist in the army and with the administrative difficulties he is faced with.

Boothby, W. M., 1952
U. C. Luft, and O. O. Benson
GASEOUS NITROGEN ELIMINATION: EXPERIMENTS WHEN BREATHING OXYGEN AT REST AND AT WORK WITH COMMENTS ON DYSBARISM. — Jour. Aviat. Med., 23 (2): 141-158, 176. 1952. DLC (TL555. A1A4, v. 23)

The authors measured the nitrogen elimination from the tissues of subjects breathing oxygen from successive rebreathing bags. The pulmonary nitrogen was first washed out by 6 maximal expirations and inspirations of pure oxygen without rebreathing. When the eliminated tissue nitrogen is plotted against time on a log-log graph, a straight line results. Physical work (walking on treadmill) speeds up the nitrogen elimination as compared to rest (sitting). Formulae are derived expressing the amount and rate of nitrogen elimination as functions of time and of constants denoting individual variation and physiological state (work). — The rate of nitrogen elimination from the various parts of the body differs: the first to be eliminated is the pulmonary nitrogen, followed by that contained in the intrathoracic organs, and finally that of other organs. No evidence has been found that the skin takes up nitrogen from the surrounding air, but these experiments are not conclusive. — A sufficient degree of denitrogenation before ascent to altitude prevents dysbarism (decompression sickness).

Boothby, W. M. 1952a
PULMONARY AND TISSUE GASEOUS NITROGEN ELIMINATION RESULTING FROM 1. HYPERVENTILATION BREATHING AIR; 2. BREATHING OXYGEN NORMALLY. — Scandinavian Journal of Clinical and Laboratory Investigation (Oslo), 4 (2): 152-161. 1952. In English. DSG

The study presents a critical review of the Boothby and Lundin experimental method of verifying quantitatively the various phases of gas exchange during hyperventilation (cf. Boothby, W. M., and G. Lundin. Rate of gaseous nitrogen

elimination breathing oxygen. Proc. Physiol. Soc. In: Jour. Physiol. (London), 112 (3-4): 12P-13P. 1951).

Boring, R. O. 1952
THE EFFECT OF VISUAL STIMULUS VARIABLES UPON THE PERCEPTION OF THE VISUAL VERTICAL. — August 13, 1952. 6 p. Tulane Univ., New Orleans, La. (Contract N7onr-434, Task order 1); and Naval School of Aviation Medicine (Project report no. NM 001 063.01.28; Joint project report no. 28) (TIP U24801). UNCLASSIFIED

An experiment was set up to test the hypothesis that, when the main lines of the visual field are parallel to the direction of the gravitational force, even though the head or body be tilted, there will be a consistency between visual and proprioceptive cues which yields an invariant resultant; but when the visual field is tilted, judgments of verticality will be more variable. Four college undergraduates were tested in a lateral tilt chair. They faced a movable framework and a luminescent 12-in. rod which were inclined independently at angles of 30° right, 0°, and 30° left. The subjects were instructed to set the target parallel to the walls of the room. No significant differences were found between mean average errors or mean constant errors under consistent and discrepant conditions. The visual frameworks appeared to be insufficient to test the hypothesis. (TIP abstract)

Boring, R. O. see also Mann, C. W., 1952c

Boura, M. 1952
[ON A PULMONARY FUNCTION TEST: MAXIMUM VOLUNTARY VENTILATION PER MINUTE] A propos d'un test d'exploration fonctionnelle pulmonaire: la ventilation maxima minute volontaire. — Médecine aéronautique (Paris), 7 (3); 257-265. 1952. In French. DLC (TL555.M394, v. 7)

Describes a laboratory method for measuring the maximum pulmonary ventilation and suggests that this test be applied in the selection of aviators.

Bourdinaud, J. see Plas, F., 1952a
Bousquet, C. see Lemaire, R., 1952a

Bouverot, P. 1952
[THE ADAPTATION OF FLYING PERSONNEL TO THE CLIMATE OF SOUTH VIETNAM] L'adaptation du personnel navigant au climat du Sud-Vietnam. — Médecine aéronautique, 7 (4): 495-500. 1952. In French. DLC (TL555.M394, v. 7)

Physiological changes observed in 22 fighter pilots on duty in South Vietnam are discussed. During the first three months of acclimatization and in the course of a 13-to-16-month stay in the tropical climate of South Vietnam, the following physiological changes became apparent: in all pilots signs of fatigue, neurocirculatory instability, respiratory disorders, sleeping difficulties, and decrease in hemoglobine rate. Loss of weight was found in 50% of the pilots. Attacks of amebiasis were experienced by subjects who stayed on for a longer period in Indochina.

Bowen, H. M., 1952
M. L. Lushington, and others
RAF RADAR RESEARCH UNIT. — Flying Personnel Research Committee (Gt. Brit.). [Report no. 780, March 1952]. 4 p. (AD 9757). UNCLASSIFIED

This investigation is concerned with the psychological processes operating when an observer detects, identifies, and interprets a radar signal. The objective is to develop a point of view and a policy for conducting radar research in a psychological laboratory. Work on the synthetic radar generator is reviewed and conclusions are presented which relate to the detection thresholds of a target signal implanted in video noise on a B-scan. The approach to be used to analyze the radar task is to separate it into its psychological operations and determine the manner in which a human observer deals with these basic tasks. A discussion is presented concerning signal detection. Two types of perceptual cues are distinguished. These are the static and temporal cues. Two tests are described which show promise in answering questions regarding the behavior of the signal with respect to time and space. An experiment is also described which concerns the availability of the different types of information displayed by a radar signal and is designed to be independent of particular radar variables. (AD abstract)

Bowen, H. M. 1952a
THE DETECTION THRESHOLD: INTERMITTENCY OF SIGNAL APPEARANCE. — Flying Personnel Research Committee (Gt. Brit.). Report no. FPRC 799, July 1952. 3 p. DSG (W1 qGR355) UNCLASSIFIED

The purpose of this experiment was to determine what effect the rate of signal appearance has on the Detection Threshold of [Radar] signals in the presence of Video noise. The results show that signal appearance rate has negligible effect for the conditions tested. It was shown, however, that when the scan speed was fast, signal detection did deteriorate. This deterioration was traced to change in the appearance of the noise background and not to different appearance rates. (Author's summary)

Box, N. E. H. 1952
BAROTRAUMA. — Med. Jour. Australia, 1 (16): 538-550. 1952.
DSG (W3 AU677, v. 1)

Otitic barotrauma is a condition due to the differential between the intratympanic pressure and that of the ambient atmosphere. It may occur both during flight and in the decompression chamber.

During ascent, the normal Eustachian tube opens spontaneously at a pressure differential of about 1/4 pound per square inch. During descent the tubes do not open spontaneously but may be aided by swallowing, yawning,or shouting; if the tubes do not open, pain, deafness, tinnitus, and vertigo may be induced. In the selection of aviators the candidates must demonstrate their ability to autoinflate both ears. With many normal persons this can be learned by practice. In sinus barotrauma, pain is more pronounced due to the congestive nasal condition. Dental barotrauma usually occurs during ascent and there is a relief on descent.

Boysen, J. E. 1952
and A. F. Meyer
THE USAF PHYSICIAN ENGINEER TEAM: AN EVALUATION OF THE FUTURE. — Military Surgeon, 111 (6): 395-410. 1952.
DLC (RD1.A7, v. 111)

With the rapid technological advances in modern aviation the advisory function of the U. S. Army Airforce (USAF) Medical Service has become essential. Research activities such as toxicology, hazard evaluation, analyses of stream and atmospheric pollution, and the physiological aspects of human engineering are among the most prominent. Maintaining and increasing the productive efficiency of the individual employee in the aviation industry should be another vital task of the medical service of the USAF. Preplacement and pre-employment physical examinations, control of working conditions, prevention of contageous diseases, etc., and devising methods of employing the physically handicapped would be among the chief functions in that direction. Special requirements for the aviation surgeon and for the production engineer in terms of specialized training and indoctrination are proposed and analyzed in detail.

Branscomb, B. V. 1952
and G. W. Wright
EFFECTS OF CONTROLLED LOW OXYGEN BREATHING UPON EXCHANGE OF RESPIRATORY GASES IN HUMANS. — Federation Proceedings, 11 (1I): 16. 1952. DSG

The gas exchange in a human subject was measured continuously by the open-circuit method throughout the following consecutive phases of an experiment: (1) breathing air without controlled breathing pattern (20 min.); (2) breathing air (pO_2, 148-153 mm. Hg) with controlled breathing pattern (30 min.); (3) breathing an oxygen-nitrogen mixture (pO_2, 105-115 mm. Hg) with controlled breathing pattern (60 min.); and (4) breathing air with or without controlled breathing pattern (20 min.). The CO_2 output remained constant through all periods. The oxygen uptake decreased markedly during period (3), to 10-40% of the control level.

Brewer, H. E. see Schaefer, K. E., 1952a
Bridges, W. G. see Welch, G. E., 1952

Broadbent, D. E. 1952
PAVLOVIAN CONDITIONING AND VIGILANCE TASKS. — Medical Research Council (Gt. Brit.). Applied Psychology Research Unit, Cambridge. Report A. P. U. 175/52, July 1952. 10 p. (AD 10 061). UNCLASSIFIED

Mathematical and experimental evidence found in the literature indicates that only certain aspects of the total stimulus situation can initiate complex responses at one time; stimuli possessing intensity, biological importance, and novelty are most likely to be selected. These principles have advantages over existing theories in that they account for many phenomena of classical conditioning, give an explanation for extinction, and provide a rational interpretation of some human experiments. No theory of learning is presented, but an attempt is made to remove certain confusing phenomena in preparing for future theories. (AD abstract)

Broadbent, D. E. 1952a
THE ROLE OF AUDITORY LOCALISATION IN ATTENTION. — Flying Personnel Research Committee (Gt. Brit.). Report no. FPRC 808, Oct. 1952. [A. P. U. 171/51] 7 p. (TIP U69639). UNCLASSIFIED

The ability of discriminating auditory signals or spoken messages from noise interference was studied on various groups of test subjects. The subjective impression of spatial separation of sound sources (loudspeakers arranged at a 90° angle, or one above the other at slightly altered time relations) determines the ability to discriminate. A two-loudspeaker arrangement each opposite one ear was found superior to the use of earphones, while no difference was found between this loudspeaker arrangement and one in which one ear was exposed to a loudspeaker the other to an earphone. Two groups were used to confirm the bearing of localization of sound sources on discriminatory facility. When pairs of call-signs were presented with adequate time intervals between each pair, spatial separation increased the accuracy with which a desired call-sign could be picked out. At fast rates of separation, however, spatial separation was actually a hindrance to discrimination. This suggested the assumption that spatially separated sounds may be discriminated because they pass through the perceptual mechanism successively rather than simultaneously, the critical rate being of the order of one second.

Brody, S. I. 1952
OPERATIONAL AVIATION MEDICINE. — Jour. Aviation Med., 23 (3): 237-241, 285. 1952.
DLC (TL555.A1A4, v. 23)

The purpose of aviation medicine is to safeguard the lives of those who fly. Consequently the flight surgeon is primarily concerned with the prevention of accidents. In addition to his general medical background, he has to specialize in certain occupational aspects of flying. In the life

of an aviator four vital factors are closely linked together: his aircraft, his training, his responsibility for the maintenance of the plane, and his physical fitness.

The flight surgeon has a close contact with the pilots. Often he is looked upon as an advisor in personal and family matters. His contribution to the functional readiness of his organization is very significant. He has an unusual opportunity to evaluate flight personnel by being familiar with the flight characteristics of the aircraft, considering the attitude of each pilot towards his type of plane, watching over proper maintenance procedures, and ascertaining that each pilot is a good flight risk.

Brogan, F. A. 1952
A SIMPLIFIED TECHNIQUE FOR MEASURING THE AUDITORY INTENSITY DIFFERENCE-LIMEN. — School of Aviation Medicine, Randolph Field, Tex. Nov. 1952. iii+9 p. (Project no. 21-27-001, Report no. 9). (DSG)
PB 108274

A simplified auditory intensity difference-limen measuring device for research and clinical purposes is described which can be calibrated accurately so that error is less than 5 percent. The error that is present in this instrument is constant in percentage of the result. The operation is simple and direct; values of the difference-limen may be read directly from an attenuator if the dial plate is recalibrated in terms of the table showing difference-limen with associated values. With the exception of the low-frequency oscillator, all material used is normally available in any acoustics laboratory. (Author's summary, modified)

Brogan, F. A. see also Cibis, P. A., 1952d; Tonndorf, J., 1952, 1952a, 1952b

Brognoli, C. 1952
and B. Boles Carenini
[ON THE POSSIBILITY OF INFLUENCING THE ALTERATIONS OF THE BLIND SPOT AND OF THE ANGIOSCOTOMATA CAUSED BY ANOXIA, BY MEANS OF DRUGS] Sulla possibilità di influenzare con mezzi medicamentosi le alterazioni della macchia cieca e degli angioscotomi da anossia. — Rivista di medicina aeronautica (Roma), 15 (2): 274-286. 1952. In Italian, with English, French, Spanish, and German summaries (p. 284-286). DLC (T555.A1R5, v. 15)

The authors assumed that the enlargement of the blind spot and of angioscotomata as induced by anoxia, could be reduced by vasodilating drugs (amyl nitrite and nicotinic acid). Perimetric studies, conducted with normal subjects inhaling a mixture of low oxygen content, revealed that generally the dilatation of both the blind spot and the angioscotoma is more or less proportional to the decrease of oxygen supply. In the majority of cases amyl nitrite, administered in a state of anoxia, restricted the area of the blind spot while it enlarged that of the angioscotoma. Nicotinic acid, on the other hand, in the majority of cases increased both the blind spot and the scotoma.

Brouillette, J. H. see Wing, K. G., 1952

Broussard, I. G., 1952
R. Y. Walker, and E. E. Roberts
THE INFLUENCE OF NOISE ON THE VISUAL CONTRAST THRESHOLD. — Army Medical Research Lab., Fort Knox, Ky. Report no. 101, Nov. 6, 1952. ii+17+8 p. (AMRL Project no. 6-95-20-001, Subtask S-3; AD 2790).
UNCLASSIFIED

The relative effects of two noise intensities (90 and 45 decibels) on the perception of small bright targets exposed for 9 seconds on a constant and less bright field were studied. During 2 hours most subjects were able to respond correctly (press trigger with left hand) within 5.5 sec. to the smallest brightness difference presented. A 90-decibel environment significantly increased the time needed to respond to faint light differences when they were near the discrimination threshold. However, this did not seem to be related to the over-all duration of exposure to the noise. (AD abstract)

Brown, Arnold L., 1952
G. F. Vawter, and J. P. Marbarger
TEMPERATURE CHANGES IN HUMAN SUBJECTS DURING EXPOSURE TO LOWERED OXYGEN TENSION IN A COOL ENVIRONMENT. — Jour. Aviation Med., 23 (5): 456-463. 1952.
DLC (TL555.A1A4, v. 23)

Twenty healthy men (age, 21-29 years) were exposed to a temperature of 50° F. Ten men (Group I) breathed oxygen at normal pressure for 90 minutes; the remaining ten (Group II) were subjected to anoxia for 90-120 minutes either at a simulated altitude of 18,000 feet in the decompression chamber or by breathing a mixture of 10% oxygen and 90% nitrogen at ground level. In the control group (I), the rectal temperature increased slightly in the first 30 minutes of cold exposure, then gradually declined; the average skin temperatures fell most rapidly during the first 10 minutes; systolic and diastolic pressures rose by 10 mm. Hg; the heart rate stabilized at 70 beats per minute; and the arterial oxygen concentration remained unchanged. In the anoxic group (II), the rectal temperature slowly declined; the skin temperatures were as in Group I; the systolic pressure rose by about 16 mm. Hg while the diastolic pressure remained stable; and the heart rate rose to 100. When, at the end of the experiment, Group II was given 100% oxygen to breathe, the rectal temperature rose in 5 and continued to drop in the other 5 subjects. — The individual variations observed in the experiment suggest that a study of the responses of capillary beds to environmental changes would be desirable.

Brown, Arnold L., 1952a
G. F. Vawter, and J. P. Marbarger
TEMPERATURE CHANGES IN HUMANS DURING EXPOSURE TO LOWERED OXYGEN TENSION IN A COOL ENVIRONMENT. — School of Aviation Medicine, Randolph Field, Tex. Sept. 1952. 3+11 p. (Project no. 21-23-013. Report no. 4; TIP U24232). PB 107533

Same as the paper, Brown, A. L., 1952.

Brown, Barbara 1952
J. W. Stutzman, and G. L. Maison
HYPOXIC ALTERATIONS IN BLOOD PRESSURE AND PULMONARY VENTILATION IN THE ANESTHETIZED DOG: RELATION OF ADRENERGIC BLOCKADE. — In: Bauer, R. O. and others, The effects of drug-induced alterations ..., p. 11-28. Wright Air Development Command. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-222, June 1952 (RDO no. 696-61) (ATI 171 952). UNCLASSIFIED

The response to hypoxia (ca. 8% O_2 in N_2) of 5 minutes duration of dogs anesthetized with urethane by vein was contrasted with that of dogs anesthetized with pentobarbital by vein. The characteristic rise of blood pressure was identical in both. There was a direct relation between existing blood pressure and the pressor response which occurred on hypoxia in these animals. It is therefore proper to report pressor responses to hypoxia in percentage of initial mean arterial pressure. The data show that only a small part of the variability of response is due to this factor. The rates of ventilation of anesthetized dogs in liters per square meter of body surface per minute were found strikingly low in animals anesthetized with pentobarbital and strikingly high in those anesthetized with urethane. The quantitative responses of anesthetized dogs after adrenergic blockade were determined using a variety of blocking agents. After blockade all the agents reversed the pressor response to hypoxia. (From the authors' summary)

Brown, John L., 1952
C. H. Graham, H. Leibowitz, and H. B. Ranken
LUMINANCE THRESHOLDS FOR THE RESOLUTION OF VISUAL DETAIL DURING DARK ADAPTATION. — Jan. 1952. iii+14 p. Columbia Univ., New York (Contract AF 33(038)-22616); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-12 (RDO no. 694-45) (ATI 158 808). UNCLASSIFIED

Luminance thresholds for the visual resolution of various widths of alternating light and dark lines were determined at various times during dark adaptation. The finest gratings, representing high degrees of visual acuity, show only a single cone curve that drops from a high luminance threshold during the first moments of dark adaptation to a final steady level that is reached after about 7 to 10 minutes in the dark. Coarse gratings produce a duplex curve that shows an initial cone portion and a delayed rod portion. Visual acuity is a parameter that sets the position of a given curve on the log threshold axis. The higher the degree of resolution required, the higher the dark adaptation threshold. At a constant grating luminance, visual acuity rises rapidly to a maximum during dark adaptation; the higher the luminance, the earlier and more rapid the rise and the higher the maximum. Visual acuity increases at all dark adaptation times with increases in luminance. Implications of these findings for instrument lighting are discussed. (Authors' abstract)

Brown, John L. 1952a
THE EFFECT OF DIFFERENT PREADAPTING LUMINANCES ON THE RESOLUTION OF VISUAL DETAIL DURING DARK ADAPTATION. — July 1952. iv+27 p. Columbia Univ., New York (Contract AF 33(038)-22616); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-14 (RDO no. 694-45) (AD 5277). UNCLASSIFIED

The luminance thresholds for the resolution of grating lines were determined during dark adaptation with a Hecht-Shlaer adaptometer following 5-minute preadaptations to luminances of 11,200, 1290, 100, or 0.98 millilambert. Two observers with good vision attempted to detect the varying position of illuminated grating lines exposed for 0.016 second in a limited area; the line widths corresponded to visual acuities of 0.62, 0.25, and 0.042. Dark-adaptation curves had the same shape as curves for light detection. Curves for the finest gratings, representing high degrees of visual acuity, started at a high initial threshold luminance, dropped to a steady level after 5 to 12 minutes, and were characteristic of cone function. With coarser gratings, the curves had a duplex nature which suggested both cone and rod functions; after preadaptation to low luminances, only rod function may be evidenced. Increasing the level of light adaptation resulted in a higher initial threshold luminance and a more gradual decline; however, the final threshold luminance value was negligibly affected by the degree of light adaptation. A theoretical explanation of the results is discussed. (AD abstract)

Brown, John L., 1952b
A. L. Diamond, and H. E. Adler
THE EFFECT OF DURATION OF LIGHT ADAPTATION ON TIME REQUIRED FOR DETECTION OF A TARGET ON A SIMULATED PPI SCOPE. — Dec. 1952. iv+23 p. Columbia Univ., New York. (Contract AF 33(038)-22616); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-259 (RDO no. 694-45) (AD 12 969). PB 109898

The time necessary for the detection of a target on a simulated PPI (plan-position indicator) scope was determined for various scope luminances after different durations of light adaptation to a luminance of 3100 millilambert. Target de-

tection time increases with an increase in the duration of light adaptation up to a maximum value which varies with scope luminance. In general, detection time decreases with either an increase in target luminance or a decrease in background luminance for a given duration of light adaptation. Within the range investigated, changes in target luminance result in a greater change in detection time than comparable changes in background luminance. The implication for radar-scope viewing after adaptation to a high luminance is that optimum visibility will be obtained with maximum gain and as much negative bias as is possible without appreciable reduction of target luminance. (AD abstract)

Brown, Kenneth T. 1952
and W. F. Grether
THE EFFECTS OF PURE RED AND LOW-COLOR-TEMPERATURE WHITE INSTRUMENT LIGHTING UPON DARK-ADAPTED VISUAL THRESHOLDS. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. AF Technical report no. 6470. April 1952. iv+18 p. (RDO no. 694-41; TIP U23781). PB 107340

The effects of pure red and low-color-temperature white flood lighting upon completely dark-adapted visual thresholds have been determined. The red light was adjusted to brightness levels which pilots have been found to use as the minimal, normal, and maximal levels for night flying. For each brightness level of the red light, a brightness was found for the white light at which aircraft instruments were equally legible under the two lighting systems. Both a simulated instrument panel and a pure white panel were used as viewing panels. Six subjects were tested under each lighting condition. A higher brightness proved necessary with the low-color-temperature white light than with the pure red light in order to attain equal legibility of instruments. Both lighting systems at all brightness levels caused small increases in visual thresholds above the completely dark-adapted state. When the simulated instrument panel was illuminated at the normal brightness level, thresholds after viewing white light were 0.15 log micro-microlamberts above thresholds after viewing pure red light. (From the authors' abstract)

Brown, Robert G. see Clements, R., 1952

Brozek, J., 1952
and E. Simonson
VISUAL PERFORMANCE AND FATIGUE UNDER CONDITIONS OF VARIED ILLUMINATION. — Amer. Jour. Ophthalmol., 35 (1): 33-46. 1952. DSG

A visual-performance and fatigue test was developed and was applied to six healthy young subjects. Letters mounted on a long belt passed at irregular intervals and at varying levels behind a narrow slit in front of the subject. The head was kept at a constant distance from the slit and the letters had to be copied without looking down. The reading performance was recorded quantitatively on the basis of 6-minute work samples of 200 leters and was intended to induce visual fatigue within 2 hours. The speed of movement of the letters was set so that the number of errors would be about 10%. This was attained with the average scores (number of letters correctly transcribed out of 200) of 188.3, 189.3, and 188.0 at 50, 100, and 300 foot candles respectively. — The results have no statistical significance. The relative level of performance or the degree of deterioration in visual functions (fatigue) can only be determined if scores are known under the most strenuous and under optimal work conditions. Further research is needed.

Brozek, J. see also Simonson, E., 1952, 1952a
Bruce, R. A. see Welch, G. E., 1952
Bryan, J. G. see Tiedeman, D. V., 1952
Buchanan, A. R. see Hurley, L. A., 1952
Buchet see Achiary, 1952
Buckley, E. P. see Hill, J. H., 1952

Buettner, K. 1952
and H. Haber
THE AEROPAUSE. — Science, 115 (2998): 656-657. June 13, 1952. DLC (Q1.S35, v. 115)

"Aeropause" is a term designating that atomspheric region in which space-equivalent conditions are being approached with respect to physiological and mechanical effects (between altitudes of 20 and 200 km.). Such a functional concept should likewise be applied to zones within the aeropause. Among the functions in question are the following: boiling of body fluids, sustaining combustion of fuel, supply of diffuse daylight, and thermal interaction with the craft. The solution of the problems that arise in navigating through these zones requires the co-operation between meteorologists, geophysicists, astronomers, radiobiologists, physiologists, flight surgeons, bioclimatologists, and human engineers.

Buettner, K. 1952a
THERMAL ASPECTS OF TRAVEL IN THE AEROPAUSE— PROBLEMS OF THERMAL RADIATION. — In: Physics and medicine of the upper atmosphere: a study of the aeropause, p. 88-98. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico Press, 1952. DLC (RC1050.U5, 1952)

Heating of a spaceship by atmospheric friction will become negligible above 74.6 miles altitude. From there on the hull of the ship will assume equilibrium temperature under the influence of direct solar radiation, radiation reflected by the earth's surface, thermal cosmic radiation (near zero), and thermal emission of the ship's hull. Wall temperature values of space ships at various angles to the sun are tabulated for black, white, and aluminum covers. From these figures the vital importance of surface coatings becomes obvious. The absence of convection currents during the weightless stage in interplanetary travel will

create special physiological problems. The physiological mechanism in response to such conditions is outlined and protective measures are indicated.

Buettner, K. 1952b
BIOLOGICAL EFFECTS OF RADIATION OF POSSIBLE EXTRATERRESTRIAL ORIGIN. In: Physics and medicine of the upper atmosphere: a study of the aeropause, p. 544-547. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico Press, 1952.
DLC (RC1050.U5, 1952)

The Takata blood test (see Archiv fur Meteorologie Geophysik Bioklimatologie, B, 2: 486-508. 1951) is briefly outlined. It is based on the fact that strong doses of X-rays, neutrons, or gamma rays influence the flocculation effect of mercuric chloride on blood serum. Takata attempted to establish a correlation of this effect with solar phenomena (eclipses, sun spots, day-and-night variations, high-altitude effects not influenced by anoxic conditions, etc.). Experiments undertaken by the author at Randolph Field, Texas, in 1950 did not confirm Takata's findings.

Bugard 1952
[THE LIMITS OF HUMAN RESISTANCE IN HIGH ALTITUDE AND DEPTH] Les limites de la résistance humaine devant l'altitude et les profondeurs. — Atomes (Paris), v. 7 (77): 255-260, 280. 1952. In French. DLC (Q2.A78, v. 1952)

The physiological implications of high altitude are outlined briefly, and data concerning aeroembolism, explosive decompression, resistance to anoxia, and resistance to acceleration are tabulated. A graphic representation is given of the physical characteristics of the atmosphere at high altitude.

Bugard, P. J. 1952
[MEASUREMENTS OF VIBRATORY SENSATION THRESHOLDS IN MAN] Mesure des seuils de sensation vibratoire chez l'homme. — Journal de physiologie (Paris), 44 (2): 230-233. 1952. In French. DSG

Human thresholds of vibration perception were measured with the aid of a specially designed electrovibrator producing frequencies from 50 to 1,200 cycles per second and a hyperecho generator of ultrasonic vibrations. Sensitivity varied from one person to another. Threshold values changed according to body regions affected. Local anesthesia did not affect vibratory sensation thresholds. Sensations changed from a tickle (500-900 c.p.s.) to a stinging sensation (900-1,200 c.p.s.), which became quite intense (at 1,500 c.p.s.) and persisted after the stimulus had ceased. At 19,600 c.p.s. the threshold sensation was that of a velvety feeling, which changed into a prickling sensation and was finally perceived as intense heat. At very high frequencies (936,000 c.p.s.) perception was retarded for about 10 to 20 seconds and ended in a burning sensation.

Bulle, P. H. see Aviado, D. M., 1952, 1952a

(Bur. Safety Invest.) 1952
ACCIDENTS IN U. S. SCHEDULED AIR CARRIER PASSENGER OPERATIONS. (1ST SIX MONTHS 1952). — Civil Aeronautics Board. Bureau of Safety Investigation, Washington, D. C. July 1, 1952. 12 p. DCAB

A statistical compilation is presented of the comparative safety records of domestic and international air lines (broken down by companies). A total tabulation of the figures reveals that during the first six months of 1952, 12,739,281 passengers were transported a total of 7,531,962,000 passenger miles, at a fatality rate of 1.8 per 100 million passenger miles. During the corresponding period in 1951, the fatality rate had amounted to 2.0. The fatality rate compiled for U. S. airlines alone was 0.8 in 1952, and 1.9 in 1951, for the respective 6-month periods. (cf. Bur. Safety Invest., 1952a)

(Bur. Safety Invest.) 1952a
ACCIDENTS IN U. S. SCHEDULED AIR CARRIER PASSENGER OPERATIONS (1ST QUARTER 1952). — Civil Aeronautics Board. Bureau of Safety Investigation, Washington, D. C. July 1952. 12 p. DCAB

The data on the safety record of commercial aviation contained in this report are also incorporated in the report, Bur. Safety Invest., 1952.

(Bur. Safety Invest.) 1952b
NON-AIR CARRIER ACCIDENT TREND REPORT (1ST ONE THOUSAND - 1952). — Civil Aeronautics Board. Bureau of Safety Investigation, Washington, D. C. July 15, 1952. 27 p. DCAB

A statistical tabulation of accidents of non-military non-air carriers (i.e., aircraft whose principal aim is other than transportation for hire of persons or property from one place to another) is presented. The following tables are included: Injury Index and Aircraft Damage, Division of Personal Injury, Injury Index vs. Primary Cause, Injury Index vs. Operational Phase, Injury Index vs. Emergency Conditions, Injury Index vs. Type of Accident, and Conditions of Flight and Related Factors. The statistics comprise instructional, noncommercial, commercial, public and miscellaneous flights.

(Bur. Safety Invest.) 1952c
A STATISTICAL ANALYSIS OF ACCIDENTS IN INSTRUCTIONAL NON-AIR CARRIER OPERATIONS — 1951. I. — Civil Aeronautics Board. Bureau of Safety Investigation, Washington, D. C. June 1, 1952. DCAB

The total number of accidents in non-military instructional operations (training flights) for the year 1951 was 799. Pilot error was the primary cause (80.5%). The principal individual factor was misuse of brakes and flight controls on the ground

(127 accidents). Failure to maintain flying speed accounted for 66 accidents. Weather was the next factor in causing accidents. A breakdown of injury indexes in accidents as related to pilot age reveals the highest index to be in the 25-to-29-year age group. The appended statistical tables include the following: non-air accidents during instructional operations; primary causes of accidents in dual and solo instruction; operational phases of non-air-carrier accidents in instructional operations; accidents vs. injury; type of accident by class of instruction; and related factors in instructional non-air-carrier accidents.

(Bur. Safety Invest.) 1952d
A STATISTICAL ANALYSIS OF NON-COMMERCIAL NON-AIR CARRIER ACCIDENTS — 1951. II. — Civil Aeronautics Board. Bureau of Safety Investigation, Washington, D. C. June 1, 1952. 25 p. DCAB

Accidents in pleasure flying during 1951 numbered 1788, 80% of which were attributable to pilot error. Power plant failure was second in occurence, followed by airport terrain and weather as causative factors. The arrangement of the report is basically identical with that of the report, Bur. Safety Invest., 1952c.

(Bur. Safety Invest.) 1952e
A STATISTICAL ANALYSIS OF COMMERCIAL NON-AIR-CARRIER ACCIDENTS — 1951. III. — Civil Aeronautics Board. Bureau of Safety Investigation, Washington, D. C. June 1, 1952. 23 p. DCAB

A total of 66 accidents were recorded during 1951 in non-military passenger-carrying operations. Pilot error was the primary cause (50%) of the accidents, motor failure and airplane structure being next in line. This reports follows in arrangement the report, Bur. Safety Invest., 1952c.

(Bur. Safety Invest.) 1952f
A STATISTICAL ANALYSIS OF PUBLIC FLYING AND MISCELLANEOUS NON-AIR CARRIER ACCIDENTS — 1951. IV. — Civil Aeronautics Board. Bureau of Safety Investigation, Washington, D. C. June 1, 1952. 9 p. DCAB

During 1951, 22 accidents were recorded in public flying, 11 of which were attributed to pilot error. With regard to the age of the pilots, the following data are given: 25-29 years, 6; 30-34 years, 7; 35-39 years, 3; 40-44 years, 3; 45-49 years, 2; and 50-59 years, 1.

Burch, B. H., 1952
J. P. Kemph, E. G. Vail, S. A. Frye, and F. A. Hitchcock
SOME EFFECTS OF EXPLOSIVE DECOMPRESSION AND SUBSEQUENT EXPOSURE TO 30 mm. Hg UPON THE HEARTS OF DOGS. — Jour. Aviation Med., 23 (2): 159-167. 1952.
DLC (TL555.A1A4, v. 23)

The behavior of the heart was studied in dogs after explosive decompression (from 750 to 30 mm. Hg in 0.02 second) and subsequent recompression. The observations included x-ray photography, electrocardiogram, direct observation of the heart and of the inside of the right ventricle through plastic windows, and various methods of resuscitation. X-rays showed that the heart increased in diameter and that, in 9 of 12 dogs, gas appeared in the heart. Gas was also seen in the coronary vessels of some of the dogs by visual observation. The heart rate was first decreased (bilateral vagotomy abolished this reaction) and later showed a tendency to increase. 60 to 180 seconds after decompression, visible ventricular contractions ceased completely though electrocardiographic activity continued. Efforts were made to resuscitate the animals after recompression, by cardiac massage, pressure breathing of air or oxygen, and injection of various drugs. Resuscitation was successful in only one case in which neosynephrine was injected into the heart; the heart resumed beating and the animal recovered.

Burch, B. H. see also Cole, C. H., 1952

Burkhardt, W. L. 1952
and L. E. Moses
EFFECT OF ALTITUDE ON SIMULATED SINUS FRACTURES AND OTHER CONDITIONS INTRODUCING AIR INTO THE SKULL. — Jour. Aviation Med., 23 (1): 38-43. 1952.
DLC (TL555.A1A4, v. 23)

Dogs with air trapped in the cranial cavity were exposed to altitude in the decompression chamber. The air had been injected through a hole drilled with a dental burr on the side of the skull. The following data were recorded: arterial pressure and heart rate (in the carotid artery), respiratory rate and amplitude, and cerebrospinal fluid pressure (in the cisterna magna). Oxygen was administered at intervals through a tracheal cannula when necessary and x-ray exposures were made at intervals. The x-ray pictures showed no change in air volume during ascent. In the majority of the dogs, the cerebrospinal pressure rose (maximum observed, over 100 mm. Hg), but neither heart rate, blood pressure, nor respiratory rate were significantly affected. Three dogs, however, became suddenly apneic at 4,000, 8,000 and 13,000 feet respectively: in these, the pressure in the cisterna magna had not increased significantly, probably because of mechanical block at the cerebello-medullary junction. — Implications with regard to air transportation of pneumocephalic patients are discussed.

Burkhardt, W. L., see also Reissmann, K. R., 1952

Burnright, T. R. 1952
ULTRAVIOLET RADIATION AND X-RAYS OF SOLAR ORIGIN. — In: Physics and medicine of the upper atmosphere: a study of the aeropause, p. 226-238. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico Press, 1952.
DLC (RC1050.U5, 1952)

Data are presented concerning the altitude and intensity distribution of ultraviolet and X-rays in the upper atmosphere, obtained from measurements by means of rockets. X-radiation shorter than 8 Å has been found to be extremely rare. From the data obtained it is concluded that solar ultraviolet and X-ray hazards to passengers in space vehicles would be negligible. A reasonable thickness of the walls would provide adequate protection.

Burr, H. S. 1952
and R. B. Livingston
EFFECT OF HYPOXIA AND HYPERCAPNEA ON STANDING POTENTIAL OF MAN. — Federation Proceedings, 11 (1[1]): 21. 1952.
DLC (QH301.F37, v. 11)

Measurements of "standing potentials" (DC potentials of the body), which vary with increasing anoxia and hypercapnia, were made on 18 medical students in an attempt to activate a signal warning mechanism against anoxic anoxia. Change in potential began at 15,000 feet. Withdrawal of oxygen at 26,000 feet caused a marked shift in potential prior to collapse. Similar alterations in standing potentials were observed in subjects after breathing of increasing amounts of CO_2.

Bush, S. G. see Parr, W. H., 1952

Byrnes, V. A. 1952
NEW AIR FORCE EYE EXAMINATION FOR FLYING. — Texas State Jour. Med., 48 (9): 630-634. 1952.
DLC (T11.T43, v. 48)

The new eye examination given by the Air Force and described in Air Force Manual 160-1 (Sept. 1951) is outlined. The visual functions essential for flying (visual acuity, depth perception, etc.) are listed and the basic criteria for the make-up of the test are discussed (they should be understandable to nonophthalmologists, should require little equipment, etc.). The basic methods of conducting the test are described and the principal qualifying and disqualifying factors listed.

Byrnes, V. A. 1952a
OPHTHALMOLOGY. — U. S. Air Force Medical Service Digest, 3 (9): 24-26. 1952.
DSG (W2 A403u, v. 3)

Among the factors instrumental in depth perception, binocular parallax (stereoscopic vision) loses its effectiveness beyond a distance of 1000 feet because of the relatively close distance between the observer's eyes. Prerequisite for binocular parallax depth perception is a clear retinal image, which cannot be obtained at the high speeds of landing. It is for that reason that the Howard-Dolman depth perception test (in which binocular parallax is measured) does not give a true rating of landing ability (in practice, depth perception during landing maneuvers is effected by such auxiliary factors as size of retinal image and motion parallax). The use of modified sunglasses is recommended, which are provided with ground-in clear segments to be used for reading the instrument panel; in this manner the blinding effect of outside glare may be overcome. The advisability of contact lenses is discussed at length, and it is concluded that the disadvantages (discomfort after a few hours of wear, difficult fitting, danger of losing, etc.) outweigh by far the advantages.

Caldbick, G. D. see Sellers, A. H., 1952, 1952a
Calhoun, W. W. see Redmond, R. F., 1952

Campbell, P. A. 1952
HUMAN ORIENTATION DURING TRAVEL IN THE AEROPAUSE. — In: Physics and medicine of the upper atmosphere: a study of the aeropause, p. 488-493. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico Press, 1952.
DLC (RC1050.U5, 1952)

Orientation of man in his environment involves integration of stimuli received from the visual, the kinesthetic, and the vestibular systems. The normal functioning of these mechanisms is determined by the following limiting factors: (1) adequate oxygenation must be provided for unimpaired performance of the brain and nerves; (2) abnormal motions such as spinning and tumbling should be avoided; (3) violent or prolonged linear or angular accelerations should not be applied; and (4) gravitational forces should not deviate markedly from 1 g. The paper reviews briefly the present status of experimental research on human reactions under conditions where the above limitations are exceeded.

Campbell, P. A. 1952a
MEDICAL ASPECTS OF FLIGHTS ABOVE THE ATMOSPHERE. — Jour. Amer. Med. Assoc., 150 (1): 3-6. Sept. 6, 1952. DSG

Flights beyond the atmospheric layer of the earth create a number of physiological problems which may be divided into the following main categories: (1) those resulting from rapid penetration of the atmosphere (high temperature and acceleration); (2) those resulting from loss of the life-sustaining qualities of the atmosphere (oxygen, nitrogen, carbon dioxide, and water); and (3) those resulting from the loss of protection afforded by the filtering qualities of the atmosphere (cosmic and ultraviolet radiation, meteorites). The physical and physiological factors involved are briefly summarized.

Cannon, J. L. 1952
ESTIMATION OF THE CEREBRAL BLOOD FLOW AND CEREBRAL OXYGEN UTILIZATION FROM ARTERIAL CARBON DIOXIDE TENSION. I. DEVELOPMENT OF A METHOD. — Naval School of Aviation Medicine, Pensacola, Fla. July 24, 1952. 5+8 p. (Project report no. NM 001 059.06.07; TIP U24234).
UNCLASSIFIED

Data found in the literature were analyzed in some detail and it was found that the cerebral

blood flow and the cerebral arterio-venous oxygen difference may be estimated with surprising reliability from the arterial carbon dioxide tension. Certain discrepancies in the data obtained make it seem likely that the nitrous oxide technique for determining cerebral blood flow has a consistent error at low flow rates and that the cerebral oxygen consumption remains relatively constant over a wide range of carbon dioxide tension. (Naval School of Aviation Medicine abstract)

Cannon, J. L. 1952a
THE ESTIMATION OF THE CEREBRAL BLOOD FLOW FROM THE ARTERIAL CARBON DIOXIDE TENSION. II. APPLICATIONS IN AVIATION MEDICINE. — Naval School of Aviation Medicine, Pensacola, Fla. Aug. 1, 1952. 3+4 p. (Project report no. NM 001 059.06.08; TIP U24235). UNCLASSIFIED

On the basis of results of previous research it is concluded that the cerebral blood flow (CBF) increases when the arterial oxygen tension falls below 50 mm. Hg. CBF data are plotted on an arterial CO_2 tension-arterial O_2 tension diagram for convenient determination of values at different altitudes. When cerebral venous O_2 tension decreases to 15 mm. Hg, or the alveolar CO_2 tension falls below 25 mm. Hg, a slowing of cerebral circulation takes place (hyperventilation at altitude may produce unconsciousness, due to decreased CBF). If the anoxic stimulus is removed abruptly, the arterioles of the cerebral vessels receive the increased oxygen tension first and constrict, thus slowing the CBF. The brain extracts the available oxygen from the capillaries; if this is insufficient, unconsciousness may result ("oxygen paradox"). This may be avoided by slow administration of oxygen.

Carey, C. R. see Schaefer, K. E., 1952, 1952a

Cassen, B., 1952
P. Kalian, and H. Gass
HIGH SPEED PHOTOGRAPHY OF THE MOTION OF MICE SUBJECTED TO LABORATORY-PRODUCED AIR BLAST. — Jour. Aviation Med., 23 (2): 104-114. 1952. DLC (TL555.A1A4, v. 23)

An apparatus is described by which the behavior of unconstrained mice subjected to air blast may be analyzed in high-speed motion pictures (2,400 frames per second). The part of the body which is struck first by the blast wave, is violently accelerated before the other parts start moving. There is much compression and distortion of the body before the animal flies off in a twisting and rotating motion.

Cassen, B., 1952a
K. Kistler, and W. Mankiewicz
LUNG HEMORRHAGE PRODUCED IN HEPARINIZED MICE BY AIR BLAST. — Jour. Aviation Med., 23 (2): 115-119, 185. 1952.
DLC (TL555.A1A4, v. 23)

Mice were heparinized (to prevent clotting of the blood) and then exposed to air blast in a special laboratory apparatus (cf. Cassen, B., 1952). The amount of pulmonary hemorrhage which resulted from this exposure was determined (method is described in detail) 1, 15, or 25 minutes after the experiment. The results indicate that bleeding was moderate for the first 15-20 minutes and more severe after that period of time. The authors conclude that there is a hemostatic mechanism (probably vasoconstriction) in the lung tissue which prevents severe bleeding for a limited time. If no clotting takes place, profuse hemorrhage occurs after hemostasis wears off.

Cassen, B., 1952b
K. Kistler, and W. Mankiewicz
SOME EFFECTS OF AIR BLAST ON MECHANICALLY CONSTRAINED MICE. — Jour. Aviation Med., 23 (2): 120-129. 1952.
DLC (TL555.A1A4, v. 23)

Mice were held on heavy plates by attaching their feet with Scotch tape. The plates were suspended vertically at various distances from an explosive charge which was detonated. A large proportion of the mice died, gasping for breath, within 10-15 minutes after blast exposure. Autopsies showed that the mice killed had their lungs swollen to 2-3 times their normal average. Determinations were made of hemoglobin content (hemorrhage) and weight of the lungs. — In another experimental series, the mice had parts of their bodies, either thorax or head, shielded during blast exposure. Shielding of the thorax did not reduce the incidence of swollen lungs but shielding of the head did reduce it. The authors conclude that the swelling (edema) of the lung was due not to direct injury of the lung but to injury of the brain (probably hypothalamic region).

Cerf, J. 1952
[ASPECTS OF ADRENAL FUNCTION IN THE FROG SUBJECTED TO LOW BAROMETRIC PRESSURE] Aspects de la fonction surrénalienne du batracien soumis à la dépression barométrique. — Médecine aéronautique (Paris), 7 (4): 455-462. 1952. In French. DLC (TL555.M394, v. 7)

Intact frogs and frogs with the "adrenal" glands removed were exposed to simulated altitudes (20,000 to 55,000 feet) for prolonged periods of time. The following conclusions were drawn from the results of the experiment: (1) The adrenals of the frog play the same protective role against stress as the adrenal cortex of mammals; acute anoxia and decompression are badly tolerated by the adrenalectomized frog. (2) High body temperature is unfavorable for the survival at altitude. (3) Lipoid enclosures of the adrenal cells decrease during decompression. (4) Synthetic cortical steroids did not protect the adrenalectomized frog against heat or altitude stress (2 cc. of saline solution, however, given every other day, prolonged survival of the frog for several days).

Cerletti, A. see Aviado, D. M., 1952, 1952a
Chamberlain, D. M. see Cole, C. H., 1952
Chambers, A. N. see Biel, W. C., 1952
Chapanis, A. see Halsey, R. M., 1952;
Pollock, W. T., 1952

Chardon 1952
[SOME ASPECTS OF SERVICE APTITUDE AMONG NON-FLYING PERSONNEL OF THE AIR FORCE] Considérations au sujet de quelques données relatives à l'aptitude au service dans le personnel non navigant de la Force Aérienne. — Annales belges de médecine militaire (Liège), 105 (3): 51-58. In French.
DSG (W1 AN 3092, v. 105)

On the basis of physical examinations carried out on 4,825 applicants (16 to 45 years old) for nonflying positions in the Belgian Air Force, the following criteria were studied: (1) anomalies of color vision; (2) anthropometric values; and (3) possible correlations of physical constitution and actual performance efficiency. Only 17% were found capable of distinguishing all colors; 27% could not distinguish clearly any color; 50% encountered difficulties in identifying green. The average height (of 3,578 subjects) was 1.702 m. [5 feet 7 inches], the average weight 63.098 kg. [140 lb.], and the thoracic circumference 86.3 cm. [34 in.]. Aptitude to service augments up to the age of 20. No correlation was observed between anthropometric measurements and actual capacity under physical strain.

Chardon, G. see Malmejac, J., 1952b
Chatham, J. D. see Hill, J. C., 1952

(Chem. Corps Med. Lab.) 1952
ACUTE TOXICITY OF CEE BEE R-66 AIRCRAFT BRIGHTENER. — Army Chemical Center. Chemical Corps Medical Labs., Md. [1952]. 4 p. (Project no. 4-61-14-002, Summary report; TIP U21765). UNCLASSIFIED

Acute toxicities were evaluated incident to the use of the aircraft brightener compound which consists of 6% H_3PO_4, 5% iso-PrOH, 1% wetting agent, 0.75% H_2SiF_6, 0.38% HF, 1% Methocellulose, and 85.87% H_2O. Saturated vapors were nontoxic to rats after a single 6- or 8-hr. exposure at 33° to 34° C; no significant inhalation hazard apparently exists. Intravenous doses below 790 cu.mm./kg. caused no symptomatic changes in rabbits; paralysis with dyspnea and one death with terminal convulsion occurred with doses of 790 cu.mm./kg. Percutaneous application to the clipped backs of rabbits and rats produced erythema within 1 hr. with little subsequent fur regrowth; necrosis developed near the hair line of rabbits receiving 5 ml./kg. and did not clear before 10 to 14 days. The agent did not permanently damage the cornea of rabbits but produced fluorescein staining, conjunctival inflammation, and edema in doses as low as 0.1 cu.mm. (TIP abstract)

Chinn, H. I. 1952
and L. J. Milch
COMPARISON OF AIRSICKNESS PREVENTIVES. — Jour. Applied Physiol., 5 (4): 162-164. 1952. DLC (QP1.J72, v. 5)

Comparative tests of several motion sickness preventives (Lergigan, Phenergan, and Trimeton) and placebos, carried out on subjects in actual rough-weather flight, revealed the effectiveness of all drugs as compared with placebos. Phenergan proved to be the most effective preventive. Side effects were minor in all instances, drowsiness being the disturbance most commonly reported by the test subjects.

Chinn, H. I., 1952a
S. W. Handford, T. E. Cone, and Paul K. Smith
THE EFFECTIVENESS OF VARIOUS DRUGS FOR THE PROPHYLAXIS OF SEASICKNESS. — Amer. Jour. Med., 12 (4): 433-439. 1952.

Comparisons between a number of motion sickness preventives were carried out experimentally on two U.S. Military Sea Transport Service ships during routine crossings between New York and Bremerhaven. Protection against seasickness was afforded to an equal degree by the following drugs: N-(α-methyl β-di-methyl aminoethyl)-phenothiazine hydrochloride (Lergigan), prophenpyridamine (Trimeton), a mixture of diphenhydramine (Benadryl) hydrochloride and scopolamine hydrobromide, and N-benzhydryl N-methyl piperazine dihydrochloride. The antihistaminic metaphenilene (Diatrin) and the antispasmodic β-diethylamino ethyl-2-thienyl (α-2-cyclopentenyl) acetate hydrochloride (W-290) had no effect. Scopodex gave slight protection, and so did a mixture of diphenhydramine and scopolamine aminoxide. Only scopolamine was accompanied by side effects (hallucinations, nightmares, dry mouth, blurred vision, and ringing in the ears). Vomiting was generally more frequent in younger than in older persons.

Chinn, H. I., 1952b
S. W. Handford, T. E. Cone, and Paul K. Smith
THE EFFECTIVENESS OF VARIOUS DRUGS FOR THE PROPHYLAXIS OF SEASICKNESS. — School of Aviation Medicine, Randolph Field, Tex. March 1952. iii+6 p. (Project no. 21-32-014, Report no. 6; TIP U21696). UNCLASSIFIED

Same as the paper, Chinn, H. I., 1952a

Chinn, H. I. 1952c
and L. J. Milch
EFFECTIVENESS OF VARIOUS DRUGS IN PREVENTION OF AIRSICKNESS. VII. EVALUATION OF PHENERGAN AND TRIMETON. — School of Aviation Medicine, Randolph Field, Tex. August 1952. iii+3 p. (Project no. 21-32-014, Report no. 7; TIP U 23640). PB 107349

The following preparations were tested during simulated aircraft turbulence: (a) placebo; (b)

Lergigan, 25 mg.; (c) Phenergan, 25 mg.; (d) Trimeton, 25 mg. The three drugs significantly reduced the incidence of vomiting compared to that in the placebo group. Phenergan exhibited the greatest protection. Side effects of each drug were slight, with an increase in drowsiness being the most apparent. The possibility that the effectiveness of Lergigan is due to an admixture with Phenergan is discussed. (School of Aviation Medicine abstract)

Chinn, H. I. 1952d
and N. P. Plotnikoff
EFFECTIVENESS OF VARIOUS DRUGS IN PREVENTION OF AIRSICKNESS. VIII. EVALUATION OF VARIOUS TECHNIQUES FOR SCREENING ANTI-MOTION-SICKNESS DRUGS. — School of Aviation Medicine, Randolph Field, Tex. Dec. 1952. iii+4 p. (Project no. 21-32-014, Report no. 8; AD 3214). PB 108650

Benadryl, hyoscine, and Lergigan, excellent protectors against air- and seasickness, were tested for the protective ability against swing sickness and apomorphine-induced emesis. The swing, which had a 14-ft radius, was swung through a 120° arc 15 times per minute. The drugs did not offer dogs protection against either the swing or the apomorphine-induced emesis, but hyoscine did protect humans on the swing. Because of these contradictory results, the swing is questioned as a reliable screening method. (AD abstract)

Chinn, H. I., 1952e
W. R. Gammon, and M. E. Frantz
EFFECTIVENESS OF VARIOUS DRUGS IN PREVENTION OF AIRSICKNESS. IX. PROTECTION OF AIRBORNE TROOPS. — School of Aviation Medicine, Randolph Field, Tex. Dec. 1952. 3 p. (Project no. 21-32-014, Report no. 9; AD 1106). PB 108321

Airborne soldiers received placebo or medication during two flights of 5 to 7 hours' duration. The incidence of vomiting for the placebo group was 6.8 percent. The following drugs given immediately prior to take-off significantly lowered the incidence of vomiting: Wellcome 47-83 (50 mg.), Phenergan (25 mg.), Phenergan (12.5 mg.), Trimeton (25 mg.), Pyrrolazote (50 mg.), and scopolamine (0.65 mg.). Postafene (50 mg.) given 24 hours prior to take-off also afforded significant protection. None of these medications was superior to the others. (School of Aviation Medicine abstract)

Chinn, H. I., 1952f
S. W. Handford, Paul K. Smith, T. E. Cone, R. F. Redmond, J. V. Maloney, and C. McC. Smythe
FURTHER EVALUATION OF DRUGS FOR THE PREVENTION OF SEASICKNESS. — Dec. 1952. 9 p. School of Aviation Medicine, Randolph Field, Tex.; Naval Medical Research Lab., Camp Lejeune, N. C.; George Washington Univ. School of Medicine, Washington, D. C.; and Philadelphia Naval Hospital, Pa.; issued by School of Aviation Med., Randolph Field, Tex., Joint Project report (Project no. 21-32-014, Report no. 10; AD 3213). PB 108651

The following preparations afforded significant protection against seasickness when tested aboard navy transports: Lergigan, Phenergan, Trimeton, Benadryl, Parsidol, Pyrrolazote, Wellcome 47-83, Schering preparation 1667, Multergan, Parke-Davis S-45, Trimeton-scopolamine mixture, and Postafene. Lisergan, Probanthine, Isophenergan, Bentyl, Diparcol, Buscopan, Dramamine, Mosidal, Banthine, and Dibenzylene were ineffective at the tested dosages. Side effects were slight in all cases. The incidence of seasickness decreased progressively with increasing age between 17 and 39 and with increasing weight. Seasickness was least among the subjects quartered amidships. The probable chemical identity of Phenergan and Lergigan, and the relationship between chemical structure and pharmacological activity were discussed. (AD abstract)

Chinn, H. I. see also Milch, L. J., 1952, 1952a; Wang, S. C., 1952

Chiodi, H. 1952
and R. Sammartino
FATTY DEGENERATION OF THE LIVER CAUSED BY HIGH ALTITUDE HYPOXIA IN YOUNG ALBINO RATS. — Acta physiologica latino-americana (Buenos Aires), 2 (4): 288-237. 1952. In English. DSG

Rat colonies were kept in the Instituto de Biología de la Altura at Mina Aguilar, Argentina, at an altitude of 3,990 m. above sea level (average barometric pressure, 476 mm. Hg). After mating, each female was isolated. Two experimental groups were studied, Group I kept at environmental altitude pressure, and Group II kept in a pressure chamber at a total pressure of 930-960 mm. Hg and an oxygen pressure of 196-200 mm. Hg (i.e. at a pressure slightly above sea-level conditions). The young born in Group I had a high mortality rate at birth and several days thereafter (apparently due to hypoxia); in the course of their growth, they developed a progressive fatty degeneration of the liver which killed most animals between the 10th and 17th day (though 1.6% of the young survived 30 days). No such degeneration was observed in the young of Group II, not even after exposure to altitude pressure after the first 30 days of life.

Choy, D. S. J. 1952
A PLASTIC DRESSING (AEROPLAST) FOR BURNS AND SURGICAL WOUNDS. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-286, Dec. 1952. vi+35 p. (RDO no. 696-69; AD 6900). PB 111283

A general surgical dressing was developed from a modified polyvinyl chloride acetate co-

polymer in ethyl acetate solvent. Aeroplast is a nontoxic, adhesive, elastic, rapid-drying, film-forming dressing to be dispersed from an aerosol bomb or spray gun. The aeroplast treatment of experimental hog burns, the healing rate of aeroplast-treated rat wounds, and the clinical trials of aeroplast on burns and surgical wound in humans were evaluated. The following advantages were noted: (1) rapid application, (2) use by untrained personnel, (3) applicability to body parts poorly adapted to pressure dressings, (4) no retardation of wound healing, (5) transparency, (6) flexibility of dressed area, (7) impermeability to bacteria and moderate bacteriostasis which eliminate the need for periodic resterilization, (8) reduction of local loss of electrolytes and fluids and sealing of proteolytic enzymes within the area, (9) minimal storage problems, (10) feasibility of use under adverse field conditions, and (11) adaptability to mass therapy of burns. A sharp stinging, comparable to Merthiolate or alcohol burning, was felt after aeroplast application to a raw area. The stinging lasted 30 to 45 seconds and did not occur in first- or third-degree burns or in granulating wounds. (AD abstract)

Christal, R. E. 1952
A FACTOR ANALYSIS OF AIRMAN CLASSIFICATION BATTERY AC-1A AND RADAR OPERATOR FINAL SCHOOL GRADE. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. PERS 52-37, Dec. 1952. 9 p. (Project no. 503-001-0006; AD 142).
UNCLASSIFIED

The sample used for the analysis consisted of 518 airmen who were selected to attend radar operator school on the basis of airman classification battery AD-1A scores, and who later graduated. Intercorrelations are given of the tests included in the battery, along with the criterion variable (radar operator school final average grade) and education in years. Descriptions are given of the seven significant centroid factors extracted (numerical facility, mechanical experience, mechanical interest, visualization, perceptual speed, interest in things vs. interest in ideas, and verbal). Rotated factor loadings are presented of the criterion variable, education in years, and classification tests. The criterion variable had its only significant loadings on visualization, mechanical experience, and perceptual speed. The communality of the criterion was only 0.39. (AD abstract)

Christensen, J. M. 1952
QUANTITATIVE INSTRUMENT READING AS A FUNCTION OF DIAL DESIGN, EXPOSURE TIME, PREPARATORY FIXATION, AND PRACTICE. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-116, Sept. 1952. vii+51 p. (RDO no. 694-15; AD 101).
PB 108436

Experiments were conducted to determine the nature and significance of the variables involved in instrument dial reading. The subjects were required to read various types of dials at selected exposure times without knowledge of the type of dial to be exposed. The variables considered were subject, exposure time, practice, moving pointer vs. moving scale, clockwise vs. counterclockwise rotation, and point of fixation. Significant interactions were found between subjects and other factors, singly or in combination. The results indicate that a subject analysis (rather than an analysis of group means) is required in experiments of this nature. Exposure time was shown to be an influential factor. Relationships observed at one exposure time became insignificant or even reversed at other exposure times. This interaction between dial type and exposure time reflected doubt on the practice of inducing errors in dial reading experiments by the expedient of reducing exposure time. The nature of the interactions changed as a function of practice. Moving scale dials generally were more satisfactory at short exposure times, while moving pointer dials were better at longer exposure times. Dials with clockwise scales were generally superior to dials with counterclockwise scales. Point of fixation prior to exposure of the dial problem was critical. (AD abstract)

Christensen, P. R. see Guilford, J. P., 1952

Christy, R. L. 1952
A SURVEY OF PRESENT TECHNIQUES FOR EMERGENCY ESCAPE FROM AIRCRAFT. — In: Physics and medicine of the upper atmosphere: a study of the aeropause, p. 509-515. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico Press, 1952.
DLC (RC1050.U5, 1952)

The advantages and drawbacks of the following escape techniques are discussed: (1) ordinary bailout over the side of the airplane; (2) the escape chute, in which the pilot drops backward and downward; (3) the ejection seat, propelled by an explosive charge with sufficient upward velocity to clear the vertical stabilizer (two types are in use: one in which the seat is fired by the pilot reaching up and pulling a curtain down over his head and face, and the other fired by controls placed near the legs of the pilot); and (4) the ejectable cockpit capsule. Further studies are in progress on deceleration tracks, catapults, and human centrifuges to determine man's tolerance for acceleration and deceleration under various conditions.

Cibis, P. A. 1952
FAULTY DEPTH PERCEPTION CAUSED BY CYCLOTORSION. — A.M.A. Arch. Ophthalmol., 47 (1): 31-42. 1952. DLC (RE1.A62, v. 47)

Anomalies of cyclotorsion, (i.e. the rotation of the eyes around their lines of fixation normally performed to assure a single binocular image and thereby correct distance discrimination) were investigated. While cyclofusion under normal daylight conditions is forced upon by the image patterns of the surroundings, tests on 30 subjects

with normal vision have shown various degrees of cyclotorsional anomalies (intorsion or extorsion) under conditions of partial or total darkness and at different stages of light-adaption. Tests on 15 subjects breathing a nitrogen-oxygen mixture with 9.05% oxygen resulted in the distinction of 3 groups: the first showing a remarkable constancy and accuracy of measurements under all conditions; the second manifesting extorsion, and the third intorsion. Tests on alcohol-intoxicated persons were inconclusive because of the small number of subjects involved (five); in the majority of these, the depth-discrimination was not affected nor was there any change in cyclofusion ability.

Cibis, P. A. 1952a
RETINAL ADAPTATION IN NIGHT FLYING. — Jour. Aviation Med., 23 (2): 168-176. 1952. DLC (TL555.A1A4, v. 23)

Retinal adaptation is the fading out of visual sensations on continually or intermittently stimulated parts of the retina. It is responsible for the occasional loss of the perception of the night horizon and its recovery by inverted flight. This phenomenon may occur at a simulated "sky brightness" of 10^{-5} millilamberts or less under normal respiratory conditions. There is no evidence that the increased blood flow in the retina in inverted flight increases the retinal brightness discrimination. Under conditions of oxygen deficiency, the effects of retinal adaptation are enhanced. — Results of laboratory experiments testing the relation of retinal adaptation to intensity and duration of continuous and intermittent light stimuli and to body position are graphically recorded and analyzed.

Cibis, P. A. 1952b
PROBLEMS OF DEPTH PERCEPTION IN MONOCULAR AND BINOCULAR FLYING. — Jour. Aviation Med., 23 (6): 612-622, 631. DLC (TL555.A1A4, v. 23)

The author describes various experiments on factors affecting depth perception and arrives at the following conclusions: "1. That the most reliable visual perception of space is obtained by observing an unobstructed homogenous surface with simultaneous action of stereopsis, linear perspective, and motion. — 2. That stereopsis associated with linear perspective by exclusion of the cues derived from motion yields almost the same degree of reliability. — 3. Stereopsis without the effectiveness of linear perspective, but with cues resulting from motion, is less reliable than linear perspective under monocular test conditions. — 4. Depth perception is least reliable under conditions involving motion but excluding linear perspective and stereopsis. — From the foregoing conclusions one might derive that motion parallax in its traditional sense is nothing more than an alteration of size-distance relations which become overt by motion of an object or of the reference points within the visual field.... It is believed that linear perspective and size of the retinal image are the most essential cues for the proper judgment of a pilot's situation in the visual space. Therefore, the flying ability of a pilot can be improved by training and does not rely on the presence of well-developed stereoscopic vision." (From the author's conclusions.)

Cibis, P. A. 1952c
RETINAL ADAPTATION APPLICABLE TO VISUAL PROBLEMS IN FLIGHT AT INCREASING ALTITUDES. — In: Physics and medicine of the upper atmosphere: a study of the aeropause, p. 562-566. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico Press, 1952. DLC (RC1050.U5, 1952)

The lack of atmospheric scattering encountered in high-altitude and space flight imposes special problems on visual adaptation to differences in brightness of target objects. Oxygen deficiency increases the threshold of brightness discrimination. At the same time distortion of size or shape of objects due to atmospheric interference is diminished or totally eliminated. However, the brightness contrast of objects at high altitude exceeds the "borderline contrast of comfort and discomfort" (BCD), and shielding from direct sunshine becomes mandatory.

Cibis, P. A., 1952d
F. A. Brogan, and H. G. Fleck
TIME THRESHOLD PERIMETRY. I. A REVOLVING PERIMETER FOR STUDYING THE REGIONAL SENSITIVITY AND TIME FACTORS IN VISUAL SENSATION. — School of Aviation Medicine, Randolph Field, Tex. April 1952. iii+10 p. (Project no. 21-31-006, Report no. 1; TIP U22882). PB 107115

An instrumental setup is described for use in studying time factors in vision. It consists of: (a) a rotatable perimeter; (b) a click generator with variable intensity output; (c) a displacement meter for measuring the apparent displacement of visual objects due to differences in the latent period of perception; and (d) an amplifier set and dynograph.

Formulas are derived for the total light energy effective at the retina over a given time and for pattern combinations. A general outline of the applicability of the apparatus, and definitions of various time factors are given. (School of Aviation Medicine abstract)

Cibis, P. A. 1952e
RETINAL ADAPTATION IN NIGHT FLYING. — School of Aviation Medicine, Randolph Field, Tex. May 1952. iii+6 p. (Project no. 21-31-014; TIP U22747). PB 107070

Essentially the same as the paper, Cibis, P. A., 1952a.

Cima, V. see Boles Carenini, B., 1952

(Civil Aeronaut. Board) 1952
ACCIDENT INVESTIGATION REPORT: ROBIN AIRLINES, INC., NEAR WHITTIER, CALIFORNIA, APRIL 18, 1952. — Civil Aeronautics Board, Washington, D. C. Report no. SA-259

(File no. 1-0027), adopted Aug. 20, 1952; released Aug. 21, 1952. 12+3 p. DCAB

This accident, in which a C-46 aircraft crashed and burned, resulting in the death of all persons aboard, involved a pilot who had previously been denied proper certification because of a coronary heart disease. The case is analyzed in full and a correlation with the pilot's physical condition is suspected.

(Civil Aeronaut. Board) 1952a
ACCIDENT INVESTIGATION REPORT: EASTERN AIR LINES, INC., AND AIR FORCE CIVIL AIR PATROL, OCALA, FLORIDA, NOVEMBER 27, 1951. — Civil Aeronautics Board, Washington, D. C. Report no. SA-246 (File No. 1-0102), adopted Dec. 4, 1952; released Dec. 10, 1952. 12+3 p. DCAB

The causes of this accident, a mid-air collision, were attributed to human failure in that the pilot of either plane did not observe the other in time to take the necessary evasive action. In analyzing the circumstances leading to the accident, consideration is given to the fact that one of the pilots was blind in one eye and that this deficiency was a possible cause of impaired depth perception.

Clamann, H. G. 1952
CONTINUOUS RECORDING OF OXYGEN, CARBON DIOXIDE AND OTHER GASES IN SEALED CABINS. — Jour. Aviation Med., 23 (4): 330-333. 1952. DLC (TL555.A1A4, v. 23)

Sealed aircraft cabins, in contrast to pressure cabins, afford no ventilation. Excess carbon dioxide, water vapor, and other waste gases which accumulate during flight, must be eliminated by suitable means. Oxygen, which is consumed at a rate of about 47.5 liters per hour, must be replenished. The necessity of monitoring the gas composition, particularly with regard to oxygen and carbon dioxide, is discussed. A gas analyzer is described, the pneumatic refractometer, which may be used for this purpose.

Clark, B. 1952
and Graybiel, A.
THE DURATION OF THE OCULOGYRAL ILLUSION AS A FUNCTION OF THE INTERVAL BETWEEN POSITIVE AND NEGATIVE ACCELERATION. — Naval School of Aviation Medicine, Pensacola, Fla. Feb. 1, 1952. 9+[4] p. (Project report no. NM 001 051.01.28; TIP U21955). UNCLASSIFIED

The purpose of this investigation was to determine the nature of the effect of a preceding acceleration on the post-rotational oculogyral illusion and to determine the reliability of the test results of the oculogyral illusion in Naval aviators. Thirty-one subjects reported the duration of the oculogyral illusion during and following rotation for a series of trials with 6 different intervals of constant rotation between acceleration and deceleration. The inhibitory effect of the preceding acceleration was greatest when deceleration followed acceleration immediately; in some cases the post-rotational effect was eliminated completely. The inhibitory effect decreased rapidly up to approximately 30 seconds and very gradually beyond this up to 120 seconds.

The data indicate that the reliability of these measures is high, all reliability coefficients being 0.91 or higher. (From the authors' summary)

Clark, B. 1952a
and R. D. Malone
TOPOGRAPHICAL ORIENTATION IN NAVAL AVIATION CADETS. — Naval School of Aviation Medicine, Pensacola, Fla. June 1952. 1+16 p., 3 tables. (Project report no. NM 001 059.01.30; TIP U23932). UNCLASSIFIED

A test was administered which required 242 naval aviation cadets to indicate the direction to each of 20 well-known cities from 2 points of origin (Chicago and Pensacola). The average heading for the group and the variability of the group were determined, and the results were compared with calculated initial great-circle headings and headings determined from Mercator projections. Large errors were the rule for each of the 40 judgments which were typically distributed on moderately skewed distribution curves. The deviations from the great-circle headings were significant in 37 of the 40 judgments for the group. The deviation of the group from the great-circle heading was as high as 65.1°; some individual deviations approached 180°. Errors for cities located abroad were greater than for cities within the U. S. The deviations from Mercator headings were large but less than the deviations from the great-circle headings, particularly for cities outside the U. S. (TID abstract)

Clark, B. 1952b
and A. Graybiel
ILLUSORY PERCEPTION OF ROTATION FOLLOWING CONSTANT TURNS IN A LINK TRAINER. — Naval School of Aviation Medicine, Pensacola, Fla. Aug. 1952. 7 p., tables. (Project report NM 001 059.01.31; TIP U24413). UNCLASSIFIED

Thirty-one flight students were rotated in a Link Trainer at 10 r.p.m. in a completely dark room, using six different intervals of constant turn. The subjects reported their perceptions of rotation both during and following the turns. The maximum illusory effects occurred when the constant turn was held for a relatively prolonged period of time. The duration of the illusion increased sharply as the period of constant turn increased up to approximately 30 seconds and, thereafter, increased slowly up to 60 seconds with a slight increase evident up to two minutes. In most cases the illusory effects were not observed when the period of constant turn was near zero. These results show that pilots who hold prolonged constant speed turns in an aircraft without adequate visual orientation are particularly suscepti-

ble to illusory perceptions of rotation. These illusory effects can be expected in normal Naval Aviators and they should be made familiar with the fact that such illusory perceptions are normal and may be expected following prolonged constant speed turns in flight. (From the authors' summary)

Clark, B. 1952c
and R. D. Malone
THE RELATIONSHIP OF TOPOGRAPHICAL ORIENTATION TO OTHER PSYCHOLOGICAL FACTORS IN NAVAL AVIATION CADETS. — Naval School of Aviation Medicine, Pensacola, Fla. Sept. 1952. 9 p. (Project report no. NM 001 059.01.32; TIP U24962). UNCLASSIFIED

The performance of 233 Naval Aviation Cadets on a test of topographical orientation was compared with the performance of the same group on 7 other tests and with selected personal data. The correlations between the scores on the test of topographical orientation and other tests were 0.21 or below; only 3 of the correlations were significantly different from zero. A low positive relation occurred between a cadet's score on the test of topographical orientation and his own evaluation of personal orientation and travel experience. Topographical orientation appeared to be a unique characteristic which is independent of the factors measured by the current selection battery as well as of other factors such as mathematics, spatial orientation, and spatial visualization. (TIP abstract)

Clark, B. 1952d
and W. Johnson
THE TESTS OF GENERAL EDUCATIONAL DEVELOPMENT (COLLEGE LEVEL) AS PREDICTORS OF PERFORMANCE IN THE U. S. NAVAL SCHOOL, PRE-FLIGHT. — Naval School of Aviation Medicine, Pensacola, Fla. Nov. 18, 1952. 3+1 p. (Project report no. NM 001 057.16.01; AD 1028). UNCLASSIFIED

A comparison was made of the scores on the test of General Educational Development (College Level) and grades in the U. S. Naval School, Pre-Flight. The 82 cadets studied were procured from the enlisted ranks of the Navy. It was found that the test of Interpretation of Reading Materials in the Natural Sciences was the only one which consistently predicted success in several pre-flight subjects. Other possible values of these tests as selection devices for officer candidates are briefly discussed. (Naval School of Aviation Medicine abstract)

Clark, B. see also Graybiel, A., 1952
Clark, J. R. see Warren, C. E., 1952, 1952a

Clark, R. T. 1952
and A. B. Otis
COMPARATIVE STUDIES ON ACCLIMATIZATION OF MICE TO CARBON MONOXIDE AND TO LOW OXYGEN. — Amer. Jour. Physiol., 169 (2): 285-294. 1952. DLC (QP1.A5, v. 169)

Mice acclimatized by prolonged exposure to gradually increasing concentrations of CO survived oxygen deficiency (simulated altitude) for longer periods than did untreated controls. Similarly, mice acclimatized to low oxygen concentrations survived exposure to CO (0.25%) longer than untreated animals. Blood studies of the mice acclimatized to CO revealed a higher CO_2 capacity of the plasma and a lower CO_2 capacity of the whole blood as compared to the controls. In the mice acclimatized to low O_2, the CO_2 capacity was reduced for both plasma and whole blood (as has also been observed in humans living at high altitudes). Both the CO and anoxic groups showed a considerable loss of weight which was regained upon return to normal environment. The rate of oxygen consumption was about the same in the experimental groups and controls.

Clark, R. T., 1952a
D. Criscuolo, and C. K. Coulson
EFFECTS OF 20,000 FT. SIMULATED ALTITUDE ON MYOGLOBIN CONTENT OF ANIMALS WITH AND WITHOUT EXERCISE. — Federation Proceedings, 11 (1 I): 25. 1952. DSG

Gastrocnemius and diaphragm muscles of hamsters acclimatized for 6 weeks to a simulated altitude of 20,000 ft. without any exercise, were analyzed for myoglobin content. A lower myoglobin content was found in the acclimatized animals than in the ground controls. Hemoglobin content had risen to 18.8 mg. (per g. wet tissue) compared to 12.0 mg. in the controls. In another experiment, 100 male rats were divided into 4 groups: Group I was exposed to a simulated altitude of 20,000 ft. and exercised at that altitude for 20 minutes; Group II was exposed to altitude without exercise; Group III was exercised at ground level; and Group IV stayed at ground level without exercise. The myoglobin content of the heart muscle of altitude-exercised animals increased during acclimatization about 200%, and that of the gastrocnemius 50%, over the myoglobin content in the animals exercised at ground level. Myoglobin levels in Groups II and IV were lower than in the other groups.

Clark, W. C. see Steggerda, F. R., 1952, 1952a, 1952b

Clements, R., 1952
J. D. Archer, Robert G. Brown, and G. A. Emerson
CORRELATION OF PSYCHOLOGICAL TESTS AND ACHIEVEMENT RECORDS WITH SPEED OF VISUAL ACCOMODATION IN MAN. — Federation Proceedings, 11 (1 I): 332-334. 1952. DSG

Two groups of test subjects of different intelligence level and educational background (Group I consisting of medical students and student nurses, and Group II of inmates of the Texas Prison System) were given a visual accommodation speed test. Results were correlated with intelligence test scores of equal age groups (the following tests were used: Otis, Minnesota Multiphasic Personality Inventory, and the Lee and Thorpe Occupa-

tional interest tests). While speed of accommodation was found to decrease with increasing age, no correlation with intelligence or training was observed.

Cobb, B. B. see Payne, R. B., 1952

Cohen, J. 1952
and V. L. Senders
AN EXPERIMENT ON DIAL CODING. — Sept. 1952. iv+16 p. Antioch College (Contract AF 18(600)-50); issued by Wright Air Development Center, Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-209 (RDO no. 694-31) (AD 24925). UNCLASSIFIED

An experiment was performed to determine whether shape or color coding would reduce errors in locating particular dials in visual displays and decrease the time required to locate particular dials. Three equated groups of subjects were tested for five successive days on their ability to locate and check-read an instrument on a simulated instrument panel. On the sixth day, the locations of the instruments on the panel were changed, and the subjects were asked to locate instruments on the rearranged panel. The control group was tested on a panel on which all 32 instruments were identified only by labels; another groups was tested on a panel on which instruments were, in addition, identified by a color code; and a third group was tested on a panel on which instruments, besides being labeled, were identified by a shape code. Except on the early trials, the control group was slower and more variable than either experimental groups, and made more errors in locating instruments. Differences between the experimental groups and the control group were greatest for the rearranged panel. The color-code group showed, in general, a better performance than the shape-code group. The experimental results indicate that for certain panels dial coding should be recommended. (AD abstract)

Cole, C. H., 1952
D. M. Chamberlain, J. P. Kemph,
B. H. Burch, and F. A. Hitchcock
PATHOLOGICAL EFFECTS OF EXPLOSIVE DECOMPRESSION TO 30 mm. Hg. — Amer. Jour. Physiol., 171 (3): 714. 1952.
DLC (QP1.A5, v. 171)

Three series of experiments were carried out on dogs with the purpose to differentiate between the effects of explosive decompression (to 30 mm. Hg for 2.5 minutes), fast recompression after explosive decompression, and slow recompression. — Both the gross and microscopic findings were similar in all three series. Hemorrhages were found in the brain, lungs, gastrointestinal tract, heart, liver, kidney, middle and inner ear, and paranasal sinuses. Microscopic studies of the lung after decompression showed emphysema (caused by expansion of the lung during decompression) and atelectasis (developed during recompression). Fragmentation of cells with rupture of cell walls was noted in the myocardium, liver, kidneys, and the brain; the parenchyma had the appearance of a homogeneous mass.

Cole, E. L. see McIntosh, B. B., 1952; Milton, J. L., 1952b
Coles, B. C. see Sellers, A. H., 1952a
Collier, G. H. see Verplanck, W. S., 1952

Coltart, W. D. 1952
"AVIATOR'S ASTRAGALUS". — Jour. Bone and Joint Surg. (London and Boston), 34-B (4): 545-566. 1952. DSG

Of all injuries of the foot treated in the Royal Air Force between 1940 and 1945, 6% affected the talus (or astragalus). Avulsion fractures have the greatest occurrence, followed by fractures of the neck of the talus with subtalar dislocation, neck fractures without dislocations, and fractures of the talus neck with posterior dislocation of the body. The pathological anatomy of the various fractures and dislocations is discussed and illustrated with the aid of a number of X-ray photographs and diagrams. Treatments are indicated. Complications, such as infections, avascular necrosis, and traumatic arthritis of the ankle or subtalar joint, and the mechanism of the various injuries are described. Excision of the talus is not advised.

Comfort, E., 1952
R. H. Middleton, and Z. J. Baczewski
DISPOSABLE CONTINUOUS-FLOW OXYGEN MASKS. — Wright Air Development Center, Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. Memorandum Report no. WCRDF-696-107-N, March 21, 1952. 9 p. (RDO no. R-696-51; ATI 151 648). UNCLASSIFIED

The following masks were subjected to physiological evaluation: (1) H. L. Burns Disposable Oxygen Mask (Engineering Clinic, Portland, Oregon); (2) Scott Disposable Oxygen Mask No. 8600 (Scott Aviation Co., Lancaster, N. Y.); and (3) Ohio Chemical Company Disposable Oxygen Mask, K-S (Ohio Chemical Co., Cleveland, Ohio). The masks were worn by individuals seated at simulated altitudes of 20,000, 25,000, and 30,000 feet. All three masks were found physiologically adequate and capable of maintaining resting subjects in a condition equivalent to breathing air at altitudes below 10,000 feet during flight at altitudes up to 30,000 feet, when used with standard USAF continuous-flow oxygen regulators.

Comfort, E. see also Middleton, R. H., 1952
Comroe, J. H. see Wechsler, R. L., 1952

Comstock, C. C. 1952
and F. W. Oberst
COMPARATIVE INHALATION TOXICITIES OF CARBON TETRACHLORIDE, MONOCHLORO-MONOBROMOMETHANE, DIFLUORODIBROMO-METHANE AND TRIFLUOROMONOBROMO-METHANE TO RATS AND MICE IN THE PRESENCE OF GASOLINE FIRES. — Army

Chemical Center. Chemical Corps Medical Labs. Research report no. 107, March 1952. 17 p. (Project no. 4-61-14-002; TIP U21693).
PB 106778

Comparative acute inhalation toxicities on rats and mice were determined for 4 decomposition products (CCl_4, CH_2ClBr, CF_2Br_2, CF_3Br) of fire-extinguishing agents used on gasoline fires. The animals were subjected to 15-min. exposures in a 20-cu. m. gassing chamber. When fires were rapidly extinguished, CF_2Br_2 was the most toxic and CH_2ClBr and CF_3Br were about equivalent and the least toxic. Mortality was higher when fires were slowly extinguished; CF_2Br_2 and CCl_4 were most toxic to mice and rats, respectively, CH_2ClBr was second in toxicity to both animals, and CF_3Br was least toxic. The CO concentration of the chamber was about 100 times greater following slow than rapid extinction. Chamber concentration of carbonyl halides, determined as $COCl_2$, varied somewhat in different tests; the concentration was many times higher after rapid than slow extinction. Rats exhibited exophthalmia and pallor during slow extinction. Rats and mice had congestion of the trachea and lungs following exposure to all compounds. CCl_4 also caused pulmonary edema and, in rats, additional focal necrosis of the liver. (TIP abstract)

Cone, T. E. see Chinn, H. I., 1952a, 1952b, 1952f; Hanford, S. W., 1952

Conley, M. 1952
A METHOD OF SUPPORTING THE HUMAN BODY STRUCTURE DURING SPACE FLIGHT.— Jour. Space Flight, 4 (9): 3-4. 1952.
DLC (TL780.C413, v. 4)

Lightweight zippered supporters, made of webbed cotton fabric, are recommended for use in space ships to protect various parts of the body from effects of acceleration, deceleration, and zero-g conditions. They would be worn underneath the underclothing as a "second skin", to hold the body's shape and prevent rupturing of organs.

Conybeare, Sir J. 1952
MEDICINE IN THE ROYAL AIR FORCE. — In: Medicine and pathology, p. 51-65. Ed. by V. Zachary Cope. London: Her Majesty's Stationery Office, 1952.
DLC (RC971.C65)

Occurrence of cardiovascular disturbances, diabetes, albuminuria, and urinary calculus observed in Royal Air Force personnel after induction or detected at the pre-induction physical examination was quite frequent during World War II. The author attempts to develop criteria of how to deal with the various cases, when to recommend separation from the service, grounding of pilots and flight personnel, in what instances to prescribe periods of rest and rehabilitation, etc. The distinction between neurotically induced, transient, hypertension and truly pathological cases is often difficult to make for the examining physician. Organic heart diseases are usually discovered during the thorough examination of flying personnel, but remain often undetected in the ground staff. Albuminuria can frequently be attributed to overexertion. Albumen present in an early-morning urine specimen or abnormalities (red cells, white cells, or casts) in the centrifuged deposit are sure indications of serious disturbances. Urinary calculus should not necessarily require grounding or rejection. Mild cases of diabetes should not be a reason for rejection or separation. It was observed during World War II that diabetics requiring insulin treatment were able to perform satisfactory service.

Cook, S. F. 1952
and N. Pace
WHITE MOUNTAIN HIGH ALTITUDE RESEARCH STATION. — Science, 116 (3026): 697-700. Dec. 26, 1952.
DLC (Q1.S35, v. 116)

The White Mountain High Altitude Research Station was founded in 1951 near Inyokern, California, at an elevation of 10,600 feet, through the initiative of three contributing agencies: the Office of Naval Research, the National Science Foundation, and the Rockefeller Foundation for Medical Research. It has recently been made available to investigators in the physical and the biological sciences. Data are presented concerning the history of the research station, its topographic location, atmospheric and meteorological conditions, and laboratory facilities.

Cool, W. S. see Smith, Willie W., 1952

Cordier, D. 1952
and G. Peres
[THE EFFECT OF ALTITUDE AND SOLAR RADIATION ON GASTRIC PASSAGE AND INTESTINAL ABSORPTION OF GLUCOSE SOLUTIONS IN THE RAT] Influence de l'altitude et du rayonnement solaire sur le transit gastrique et l'absorption intestinale des solutions de glucose chez le rat. — Revue médicale de la Suisse Romande (Lausanne), 72 (9): 576-583. In French. DSG

Gastric passage and intestinal absorption of isotonic glucose solution in the rat were studied at two altitudes, 1800 m. and 3450 m. It was attempted to separate the effects of anoxia from those of the sunshine. At the lower altitude, some of the animals were fastened to boards in the dorso-lumbar position, some were free in cages; at the higher altitude they were all in cages. In animals placed in the shade, both gastric motility and intestinal absorption were normal at 1880 m. and during the first 24 hours following transfer to 3450 m. After this period, however, signs of general fatigue were noted, as the animals were fasting since the onset of the experiment, and were in a sympathicotonic phase due to adaptation to the altitude. — In rats exposed to sunshine for 40-50 minutes at the higher altitude, a marked decrease in both passage and absorption was seen. The animals died within one hour. When the abdominal cavity was opened, dilatation of the stomach and

congestion of the liver were noted. — If the rats were exposed to the sun at altitude for 25 minutes before ingestion of the glucose solution, survival was extended by 40 minutes.

Corliss, H. H. 1952
and A. I. Karstens
ARCTIC LABORATORY. — U. S. Air Force Medical Service Digest, 3 (9): 15-18. 1952. DSG (W2 A403u, v. 3)

The research activities of the Arctic Aeromedical Laboratory at Ladd Air Force Base, Alaska, are briefly outlined, with special regard to the following cold-weather aspects of flying: personnel equipment, nutrition, work and exercise at low temperature, frostbite and cold injuries, effects of cold on the respiratory tract, arctic environment, human engineering, and psychophysiology related to low temperature conditions.

Cornish, E. R. see Schaefer, K. E., 1952, 1952a
Cornsweet, J. see Gibson, J. J., 1952a

Cotes, J. E. 1952
and D. G. C. Gronow
FURTHER ANALYSIS OF CAUSES OF DESCENT IN DECOMPRESSION CHAMBER TESTS OF 610 FLYING PERSONNEL. — Flying Personnel Research Committee (Gt. Brit.). Report no. FPRC 794, June 1952. 5 p. (TIP U69638) UNCLASSIFIED

FPRC 794 [Morant, G. M., 1952] gives a reduction of records for 610 flying personnel who had a standard test in a decompression chamber. For each run the subject was taken to and remained at 37,000 feet for 2 hours unless obliged to descend earlier because of the onset of symptoms. Each subject had 3 runs unless he was eliminated after the 1st or 2nd run on account of severe reactions. This report provides a further analysis of the records for all the subjects who had symptoms necessitating descent. Topics treated concern: (i) The incidence and time of onset of bends, chokes, syncope, and other symptoms for subjects undergoing their first 2-hour run at 37,000 ft, and for the 1st hour of this run. (ii) The reproducibility of symptoms in subjects obliged to descent on 2 or more runs. (iii) The incidence of other less severe symptoms in subjects obliged to descend with chokes or syncope. (iv) The effectiveness of the procedure as a selection test. (Authors' summary)

Cotes, J. E. 1952a
and D. G. C. Gronow
INFLUENCE OF AGE AND WEIGHT UPON THE INCIDENCE OF DECOMPRESSION SICKNESS IN PERSONNEL BENDS-TESTED AT THE RAF INSTITUTE OF AVIATION MEDICINE BETWEEN 1943 AND 1952. — Flying Personnel Research Committee (Gt. Brit.). Report no. FPRC 795, June 1952. 5 p. (TIP U69640). UNCLASSIFIED

(1) This report gives a reduction of records for 433 personnel, 83 Service men and 350 civilians, engaged on high flying duties, who were tested in the decompression chamber at the RAF Institute of Aviation Medicine at 37,000 ft. for 1 hour, unless obliged to descend earlier because of the onset of symptoms. (2) The incidence of bends, chokes and syncope or other symptoms which necessitated descent is classified in relation to the age of the subjects, and to their weight, whether they were: under standard weight, 1-14 lb. over standard weight, or more than 14 lb. over standard weight. (3) It was found that the incidence of obligatory descents increased with age from 8% among those aged 18-24 years to 40% among those aged 35-47 years. Chokes and syncope cases made up 40% of the descents in all age groups. Their incidence increased from 7% in subjects under standard weight to 18% in subjects more than 14 lb. over standard weight. The cases of chokes all occurred in this over-weight group. (4) These findings are discussed and certain conclusions are drawn from them. (Authors' summary)

Cotton, J. W. see Verplanck, W. S., 1952
Coulson, C. K. see Clark, R. T., 1952a

Covell, W. P. 1952
and D. H. Eldredge
INJURY TO ANIMAL EARS BY INTENSE SOUND. — Aug. 1952. vi+67 p. Washington Univ. School of Medicine, St. Louis, Mo. (Contract AF 33-038-500); and Wright Air Development Center, Wright Patterson Air Force Base, Ohio. AF Technical report 6561, part 2 (RDO no. 695-63) (AD 7303). PB 119016

This report is a correlation of the data on exposure of animals to intense sounds with histologic findings for each cochlea. There are two sections to the report. The first part deals with the extent of damage and location of marked changes in the organ of Corti. The second part is concerned with a discussion of problems for further study suggested by the present findings. The pathologic changes found in microscopic preparations of temporal bones of 174 guinea pigs and 7 dogs were mostly induced by a special siren although some rod and ribbon exposures are included for comparison. The material chiefly covers the higher frequency range of 4,000 to 40,000 cycles per second with intensities ranging from 115 to 165 decibels (ref. 0.0002 microbars). (Author's abstract)

Cowles, J. T. 1952
DEVELOPMENT OF AN ALTERNATE FORM OF THE AIRMAN CLASSIFICATION BATTERY (AC-1). — Feb. 1952. v+12 p. Educational Testing Service, Princeton, N. J. (Contract AF 33(038)-13631); issued by Air Training Command. Human Resources Research Center. Personnel Research Lab., Lackland Air Force Base, Tex. Research bulletin no. 52-5 (Project no. 503-001-0001) (TIP U21878). PB 106750

Alternate forms were developed for 13 of the 14 tests in the Airmen Classification Battery:

arithmetic reasoning, aviation information, background for current affairs, dial and table reading, electrical information, general mechanics, mechanical principles, memory for landmarks, numerical operations II, pattern comprehension, speed of identification, tool functions, and word knowledge. A review of the developmental work and norming and timing data are presented. (TIP abstract)

Cox, J. A. see Zaccaria, L., 1952, 1952a
Cranmore, D. see Gell, C. F., 1952

(Crash Injury Res.) 1952
THE SITE, FREQUENCY AND DANGEROUSNESS OF INJURY SUSTAINED BY 800 SURVIVORS OF LIGHTPLANE ACCIDENTS. — Cornell Univ. Medical Coll. Crash Injury Research, New York. July 1952. viii+55 p. (Contract N6onr 264-12; TIP U23661). UNCLASSIFIED

Accidents occurring in 1000- to 3500-lb. aircraft were studied with respect to the injuries sustained by 800 survivors who used only safety belts for protection. Examinations were made of the site and frequency of injuries, the frequency characteristics of the injury pattern, dangerous-to-life injuries, and the relationship between injury seriousness and accident severity. A comparison of current and prior Crash Injury Research data confirmed the low incidence of neck strains and cervical-vertebral damage and the high frequency of injuries to the head and extremities. A distinct pattern of injury was established. A positive relationship existed between the frequency of injuries and the distance of damaged-body areas from the safety belt. Hip bruises and intraabdominal injuries were rare. Injury to one body area was not usually dependent on injury to another area. Dangerous head injuries were received by about 18% of survivors. Spinal injuries endangered life more often than lower torso injuries. Of all the variance in seriousness of injury, only 22% was a function of variation in accident severity. The statistical evidence indicates that injuries are not a direct function of crash force and that injuries in survivable accidents are largely subject to control by engineering and design. (TIP abstract)

(Crash Injury Res.) 1952a
DEVELOPMENTS TO INCREASE SAFETY IN AIRCRAFT ACCIDENTS. — In: Summary report for the fiscal years July 1, 1950 to June 30, 1952. Section 4, p. 14-21. Cornell Univ. Medical Coll. Crash Injury Research, New York. Sept. 1952. (Contract N6onr 264-12; TIP U69674). UNCLASSIFIED

Progress in research and production with regard to the following topics is summarized: (1) crashworthiness of airplanes; (2) protective harnesses; (3) seating arrangement in airplanes; and (4) safety belts and safety belt anchorages. Research activities related to these subjects undertaken by Purdue University, St. Louis University, Northwestern University, California Institute of Technology, Wayne University, Cornell Universtiy, and the Navy Special Devices Center are briefly outlined.

Crema, A. 1952
and P. Gambacorti Passerini
[ON THE TOXICITY OF SULFONAMIDES IN ANOXIA] Sulla tossicità dei sulfonamidici in anossia. — Rivista di medicina aeronautica (Roma), 15 (1): 61-66. 1952. In Italian, with English, French, Spanish, and German summaries (p. 65-66). DLC (TL555.A1R5, v. 15)

Albino mice treated with sulfapyridine by injection were exposed to anoxia. Results of the test indicate that the toxicity of sulfonamide compounds increases with altitude.

Criscuolo, D. see Clark, R. T., 1952a

Crook, M. N., 1952
J. A. Hanson, and J. W. Wulfeck
THE LEGIBILITY OF TYPE AS A FUNCTION OF REFLECTANCE OF BACKGROUND UNDER LOW ILLUMINATION. — June 1952. iv+16 p. Tufts Coll., Medford, Mass. (Contract W33-(038) ac-14559); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-85 (RDO no. 694-15; ATI 165 547). PB 107505

The legibility of lower-case type as a function of illumination level, reflectance of background, and type size was measured by means of speed and accuracy scores on a letter cross-out test. Simulated red cockpit illumination was used, covering the range from 0.014 to 0.129 foot-candles. Red light reflectance of background was varied from 0.26 to 0.87. Type sizes were 6- and 8-point. Scores fell off at an accelerated rate with decreasing illumination and background reflectance, and were lower under all conditions for 6- than for 8-point type. The specific application of these data to chart design will be covered in a subsequent report. (Authors' abstract)

Cruck, S. see Malmejac, J., 1952d

Crumley, L. M. 1952
A STUDY OF THE REQUIREMENTS FOR LETTERS, NUMBERS AND MARKINGS TO BE USED ON TRANSILLUMINATED AIRCRAFT CONTROL PANELS. VIII. A PROPOSAL FOR THE STANDARDIZATION OF AIRCRAFT ELECTRICAL AND ELECTRONIC CONTROL KNOBS. — Naval Air Experimental Station. Aero Medical Equipment Lab., Philadelphia, Pa. Report no. XG-T-192, [1952]. 10 p. 3 plates. (Project no. NAM EL 609; AD 10 809). UNCLASSIFIED

A study of the present status of aircraft electronic and electrical knobs has indicated the desirability of improvement. Of the methods suggested for accomplishing this improvement, the adoption of a relatively small, standard set of gray colored knobs with provisions for trans-

illumination where needed appears to meet the requirements better than any of the other suggested methods such as shape and/or color coding to indicate function. The Aero Medical Equipment Lab. knob series is considered to meet many of the requirements discussed and to be suitable in many respects in place of hundreds of existing knobs. The following recommendations are made: (1) that shape-coding and color-coding of electrical and electronic control knobs for use on aircraft cockpit plastic lighting plates not be adopted; (2) that gray with white markings where needed, be adopted as the standard color for electronic and electrical grips. A gray with Munsell neutral value of between 5 and 6 is considered most adequate. Skirts, where used, should be black, equivalent to the black of the plastic lighting plate; (3) that the AMEL grips be adopted as standard electronic and electrical knobs for use on control panels in naval aircraft. (Author's conclusions and recommendations)

Cruzen, M. see Senders, J. W., 1952

Cullumbine, H. 1952
CHANGES IN COMPOSITION OF TISSUES OF MICE AFTER EXPOSURE TO LOW PRESSURE. — Amer. Jour. Physiol., 169 (3): 515-524. 1952. DLC (QP1.A5, v. 169)

Male mice were placed in low-pressure chambers and exposed to pressures of 460 mm. Hg up to 48 hours. The following physiological changes were observed on animals killed at an early stage of the experiment: involution of lymphoid tissue, increase in weight, elevation of nitrogen and glycogen content of the liver, reduced carcass fat and carcass nitrogen, increase of muscle glycogen, and reduction of adrenal cholesterol content. Animals killed after longer exposure showed hypertrophy of the lymphoid tissue, reduced liver nitrogen and glycogen, and return of the carcass fat to near normal values (there was no change in the carcass nitrogen and adrenal cholesterol). Groups of fed or starved, adrenalectomized, thyroidectomized, castrated, or hypophysectomized mice were exposed to the same low pressures. Data on these groups are given and are interpreted in physiological terms.

Cunha, R. 1952
[IDENTIFICATION FROM FINGERPRINTS] Identidade das impressões. — Revista médica da aeronáutica (Rio de Janeiro), 4 (4): 83-90. 1952. In Portuguese. DSG (W1 RE609, v. 4)

The history and the elements of dactylography (dots, curved and straight lines, etc.) are discussed by comparing several fingerprints. The advantages of dactylograms are their permanency, their unchangeability, and their individuality. These factors are responsible for the use of dactylograms in the identification service of the Brazilian Air Force.

Curley, F. J. see Ingalls, T. H., 1952

Dagett, M., Jr. 1952
LET'S SIMPLIFY THE PANEL. — Flying, v. 50 (2): 26-27. 1952. DLC (TL501.P6, v. 50)

The instruments on the panel of single-engine airplanes (in the two- to five-place category) are analyzed one by one with regard to their relative importance and proper location on the panel. Improvements over present designs of instruments and changes of panel layouts are suggested for further study by construction experts. Standardization of instrument panels (in the sense that functionally similar instruments look alike and can be found in the same relative location on different airplanes) will have to go hand in hand with simplification.

Daggs, V. M. see Parr, W. H., 1952

Daley, E. A. 1952
RECENT TRENDS IN AVIATION MEDICINE ABROAD. — Med. Jour. Australia, 1 (3): 61-69. 1952.
DSG (W3 AU677, v. 1)

Medical problems associated with high altitude flight center around two main factors, altitude and speed. Problems pertinent to altitude are: (1) explosive decompression (its effects on the human frame; how to maintain ground level conditions in the cabin at 40,000 ft; safety measures); and (2) visual difficulties (sensation of haze associated with blue intensity of light, "greenhouse" effect in tropical climate). Problems related to high speed are: (1) noise (continual exposure to high-intensity sound from aircraft engines may produce deafness); (2) sensory illusions (sensation of climbing due to rapid acceleration and sensation of diving at rapid deceleration) have to be overcome; and (3) in order to avoid anxiety, constant radio communication with the ground staff is essential. — Navigators reading maps, computers, or radar screens at a distance of about 12 inches are subject to eye strain. Man's reaction time is becoming inefficient in the control of the modern aircraft. To overcome these difficulties, studies in cybernetics should be encouraged to help man act as a coordinator of the mechanical devices. In pilot selection, apart from the regular physical examinations, numerous intelligence, aptitude, and reaction-time studies should be included.

Damasio, R., 1952
L. Tabusse, and R. Jolly
[MODIFICATIONS OF THE ELECTROENCEPHALOGRAM IN HYPOCAPNIC HYPOXEMIA] Les modifications EEG au cours de l'hypoxémie hypocapnique. — Revue neurologique (Paris), 82 (2): 221-224. 1952. In French.
DSG (W1 RE609, v. 87)

A total of 70 subjects (20-46 years of age) inhaled mixtures of 7.5% oxygen in nitrogen, corresponding to the oxygen tension at an altitude of 7,500 m. The degree of anoxia was recorded with a Millikan oximeter; at the same time a six-lead electroencephalogram was registered. The subjects selected for the test fell into 3 groups: nor-

mal, 40; with neuroses, 15; and with sequelae of cranial trauma, 15. With regard to the chronology of oxygen desaturation and the morphology of the encephalographic tracings, the subjects could be grouped as to their anoxia sensitivity: Group O, no changes in the EEG until the O_2 content of the blood reached 55%; in Groups I, II, III, and IV, delta waves appeared at oxygen saturations of 60%, 70%, 80%, and above 80%, respectively. Normal subjects show the best anoxia resistance at ages between 25-35. Below 25 (when the neurovegetative maturity is not yet reached) and above 40 (when resistance decreases), subjects generally belong to categories II, III, and IV.

Damasio, R. see also Tabusse, L., 1952c

Dambly 1952
[PHYSIO-PATHOLOGY OF THE PILOT AS TAUGHT TO STUDENT PILOTS AT THE AIR FORCES ADVANCED AVIATION SCHOOL] La physiopathologie de l'aviateur enseignée aux élèves-pilotes de l'École de Pilotage Avancé de la Force Aérienne. — Annales belges de médecine militaire (Liège), 105 (1-2): 21-29. 1952. In French. DSG (W1 AN3092, v. 105)

The enormous progress in high-speed and high-altitude flying makes it necessary that the pilots of our time acquire a basic knowledge of the physiological, psychological, and physical facts involved. It is for that reason that a 20-hour course in aviation physio-pathology has been introduced in the curriculum of the Belgian School of Aviation (École de Pilotage Avancé). The program, briefly outlined in this paper, includes the following subjects: chemical effects (anoxia), protective measures, low-temperature effects, toxic action of gases, noise and vibration, acceleration, vision (particularly, sensory illusions), and aviation hygiene.

Danhof, I. E. see Steggerda, F. R., 1952, 1952a, 1952b

De Angelis, F. see Gee, A. H., 1952

Deese, J. 1952
and R. S. Lazarus
THE EFFECTS OF PSYCHOLOGICAL STRESS UPON PERCEPTUAL-MOTOR PERFORMANCE. — v+15 p. John Hopkins Univ., Baltimore, Md. (Contract no. AF 33(038)-13253); issued by Air Training Command. Human Resources Research Center, Perceptual and Motor Skills Research Lab., Lackland Air Force Base, Tex. Research bulletin 52-19, June 1952 (Project no. 509-020-0003) (TIP U24188). PB 107411

The subjects, 280 enlisted Air Force personnel, were divided into 5 groups and each was given 50 trials on the SAM Rotary Pursuit Test with Divided Attention. The control group was tested under well-defined, non-threatening circumstances. The other groups were informed that the results of this test would be a major determiner of their Air Force careers. One group was under failure-stress during trials 6-15. Another was stressed during trials 31-40 and a third group was under nonego-involving stress during trials 31-40. The last group was given no information about the adequacy of its performance. The mean performance for the experimental groups was poorer than for the control group. Failure-stress introduced early caused a small decrement in performance, while having it introduced after the skill had been well-learned produced a small improvement. (TIP abstract)

DeHaven, H. 1952
PACKAGING THE PASSENGER. — SAE Jour., 60 (6): 55-56. 1952. DLC (TL1. S5, v. 60)

New design criteria are being developed for reducing the injury potential of passenger cabins and cockpits in the landing speed range of 40 to 50 miles per hour. Among the features mentioned are loose mountings of instruments in the instrument panel, windshields that pop out when struck by the head, strong energy-absorbing nose sections, and arrangement of seats and controls with a view to passenger and pilot safety.

DeHaven, H. 1952a
CURRENT SAFETY CONSIDERATIONS IN THE DESIGN OF PASSENGER SEATS FOR TRANSPORT AIRCRAFT. — Cornell Univ. Medical Coll. Crash Injury Research, New York. June 1952. 12 p. [Contract N6onr-26412] (TIP U22524). UNCLASSIFIED

Well designed forward facing seats—and secure tie-down for "20g" safety belts—should give high degrees of protection in civil air transports, up to the point where flooring and surrounding cabin structures are destroyed. Although Crash Injury Research has developed considerable data on the effectiveness of safety belts, harness and forward facing seats, very limited information from actual crashes has become available on the protective values of various types of rearward facing seats. Some of the current military installations suggest hazards which, except under the most fortuitous crash conditions, may cause dangers which are not present in the design of improved forward facing passenger seats. Merely building "beefed up" seats and turning them around is not the answer—safety-wise. Rearward facing seats must be carefully designed and their protective qualities, as well as their deficiencies, must be thoroughly analyzed from accident-injury studies, so that the full value of rearward facing seats can be developed. Details of survivable crashes in civilian, as well as military transports, should be studied from the crash-injury point of view, so that valid conclusions can be reached on: (1) the magnitude, direction and duration of crash forces in survivable transport accidents; (2) the desirable strength for seats and safety belt installations; (3) the effectiveness of safety features in seat design; (4) the relative merits of forward facing and rearward facing seats. (Author's summary)

DeHaven, H. 1952b
and A. H. Hasbrook
SHOULDER HARNESS: ITS USE AND EFFECTIVENESS. — Cornell University Medical College. Crash Injury Research. Nov. 1, 1952. 12 p. (Contract N6onr-26412; TIP U25473).
UNCLASSIFIED

Eighty-two accidents involving surplus, single engine military trainer aircrafts flown by civilian pilots, were studied to ascertain the use and effectiveness of shoulder harness, in combination with safety belts. The data suggest that a large proportion of civilian pilots do not realize the protective value of shoulder harness. Only a small percentage of the civilian pilots, in the group studied, retained harness in their aircraft. A majority of the pilots in the 'harness retained' group were wearing shoulder harness when accident occurred. Statistical analysis shows that—so long as cockpit or cabin structures remain substantially intact—shoulder harness effectively decreases the probability of dangerous head injuries in severe accidents. It is suggested that a significant improvement of safety can be achieved in severe but survivable accidents involving civilian non-transport aircraft by; (a) indoctrinating pilots in the protective value of shoulder harness, and (b) developing a type of shoulder harness which will be acceptable to civilian pilots from the point of view of convenience, comfort, and utility. (Authors' summary)

DeHaven, H. 1952c
ACCIDENT SURVIVAL—AIRPLANE PASSENGER CAR. — S. A. E. Preprint, no. 716, 7 p. 1952.
NNSAE

The designing of airplane cockpits and cabins from the viewpoint of safety presupposes the same principles that are followed in packaging merchandise for shipping, such as: (1) the package should not open or spill its contents and should not collapse under expected conditions of force; (2) package structures should not be made of brittle or frail materials—they should resist force by yielding and absorbing energy; (3) the article contained in the package should be held and immobilized inside the outer structure ("interior packaging"); and (4) the means of holding the packaged object inside the container should transmit the forces applied to the container to the strongest part of the contained object.

A reduction of head-injury danger has been achieved in commercial airliners by designing metal seat backs of an elastic structure, padded for additional safety. Similar principles have been applied in the designing of instrument panels; instruments are mounted with shear pins allowing them to fly out of the way under heavy impact conditions. Malleable ductile metal and soft rounded contours have been employed. Other safety features are: rubber-mounted windshields, broadly rimmed control wheels, designed to distribute impact forces on the human body, improved safety belts and shoulder harnesses, and stronger cabin structures. Solutions will have to be found to compromise safety features with disadvantages in terms of added weight and costs.

Dekking, H. M. 1952
METHODS OF INVESTIGATION. — In: Advances in ophthalmology, ed. by E. B. Streiff (Bibliotheca ophthalmologica, suppl. to Ophthalmologica [Basel], no. 36), p. 37-78. 1952.
DSG (W1 BI425, fasc. 36, 1952)

A critical survey is made of recent studies on dark adaptation (p. 48-53), eye muscle balance, binocular vision (depth perception), and aniseikonia (p. 53-57). Test methods are briefly outlined.

Deschwanden, J. von, 1952
P. von Deschwanden, and B. Muller
[THE INFLUENCE OF ALTITUDE AND OF ELECTRIC CONDUCTION OF THE AIR ON SOME ELEMENTS OF THE PERIPHERAL CIRCULATION] L'influence de l'altitude et de la conductibilité électrique de l'air sur quelques éléments de la circulation périphérique. — Angéiologie et annales de la société francaise d'angéiologie et d'histopathologie (suppl. of Gazette médicale de France [Paris], 59 (1), 1952), p. 43-44. 1952. In French. DSG

Measurements of arterial dilatation and capillary resistance were carried out on residents of Adelboden, Switzerland (altitude, 1400 m.) and on controls at Bern (545 m.) and Lugano (277-329 m.). Arterial dilatation was expressed as a function of the time required to re-establish the initial peripheral body temperature ("time of arterial redilatation"). The residents of Adelboden showed a redilatation time of 20-105 minutes, depending on the physical conditioning of the subjects (outdoor workers having higher values). The values diminished after a stay of 10 to 15 days at lower regions. Capillary resistance values increased considerably when meteorologic conditions were unstable, e.g., before the "foehn" season (warm, moist winds from the south in early spring).

Deschwanden, P. von see Deschwanden, J. von, 1952

Dexter, L. 1952
CONGENITAL DEFECTS OF THE HEART IN HIGH ALTITUDES. — New England Jour. Med., 247 (22): 851-852. Nov. 27, 1952.
DLC (R11. B7, v. 247)

A high incidence of patent ductus arteriosus observed in Mexico City (altitude 7,500 feet) and in the district of Junin, Peru (altitude 10,000 feet) induces the author to suggest a correlation between these congenital anomalies and high altitude. It has been observed that, in these localities, communicable diseases such as rheumatic fever and subacute bacterial endocarditis, are rare (but not typhus); eruptive diseases, such as German measles, are practically nonexistent.

Dhiraputra, S. 1952
THE EAR IN RELATION TO AVIATION — Royal Thai Air Force Med. Gaz. (Bangkok), 1 (4): 237-265. 1952. In English. DSG

Pathological conditions of the ear connected with aviation may be caused by changes of atmospheric pressure, by noise, or by motion of the aircraft. Conditions due to changes of the atmospheric pressure can be grouped as follows: (1) aero-otitis media (its etiology, pathogenesis, prevention, and therapy are discussed in detail); (2) pressure deafness occurring during flight, temporary or chronic (in the latter case it is associated with tubal obstruction); (3) aero-otitis externa, usually due to the obstruction of the external auditory canal by cerumen or by an imperforated ear plug. — Noise levels in the cabin of the aircraft are usually above 100 decibels. Loss of hearing due to noise in the aircraft may again be temporary (e.g. acoustic fatigue) or permanent. In the latter case, certain predisposing factors have to be considered such as the person's entire hearing ability, his age, noise levels to which he had been previously exposed, equilibrium disorders, past diseases of the ear, and effects of anoxia. — Air sickness is a syndrome resulting from the random motion of the aircraft; its etiology, pathogenesis, prevention, and treatment are analyzed.

Diamant, H. 1952
[ANTIHISTAMINIC PREPARATION FOR MOTION SICKNESS] Antihistaminpreparat vid rörelsjuka. — Nordisk Medicin (Stockholm), 48 (39): 1321-1324. 1952. In Swedish, with English summary (p. 1324). DSG

Varying degrees of motion sickness were induced in 38 test subjects by means of a swing. When Amosyt (the Swedish trade name for Dramamine, beta-dimethylaminoethyl benzohydryl ether 8-chloro-theophyllinate) was administered one hour before the test, it prevented motion sickness in 52% of the subjects; fair results were obtained in another 39%. Placebos had prophylactic effect in 12%. Stimulants (amphetamine or caffeine) intermixed with Amosyt did not interfere with its antiemetic effect.

Diamond, A. L. 1952
and A. S. Gilinsky
LUMINANCE THRESHOLDS FOR THE RESOLUTION OF VISUAL DETAIL DURING DARK ADAPTATION FOLLOWING DIFFERENT DURATIONS OF LIGHT ADAPTATION. — April 1952. iv+21 p. Columbia Univ. (Contract AF 33(038)-22816); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-257 (RDO no. 694-45; AD 7464). UNCLASSIFIED

Luminance thresholds for the visual resolution of various widths of alternating light and dark lines were determined at various times during recovery from different durations of light adaptation. Increasing duration of preadaptation from one second to five minutes raises the initial dark adaptation threshold and decreases the speed of the recovery process. The level of visual acuity determines the range of luminance covered by the dark adaptation curves. (Authors' abstract)

Diamond, A. L. see also Brown, John L., 1952b; Herrick, R. M., 1952

Dickie, R. D. 1952
and B. K. Doane
APPRAISAL OF EDUCATIONAL ACHIEVEMENT OF SERVICE PERSONNEL. II. EDUCATIONAL SURVEY TEST. — Defence Research Board (Canada). Operational research memorandum no. 20, July 1952. 10+25 p. (TIP U24239). UNCLASSIFIED

Two parallel forms of the Educational Survey Test (EST), designed to assess the educational achievement of young Canadian adults, were administered in 1949 and 1950. Each form comprised 6 subtests (211 items) which covered vocabulary, spelling, reading comprehension, social studies, general science, and mathematics. A questionnaire was given with the 1949 series of tests to obtain information concerning the educational and occupational history of the men. Test results indicated a tendencey for scores to increase grade by grade with claimed schooling, but with sizeable overlap in both the 1949 and 1950 samples. Reliabilities of the subtests, based on the 1949 sample, ranged from 0.75 to 0.90; the total test reliability was 0.95. Intercorrelations between total scores and the three Service Classification tests ranged from 0.6 to 0.7. A positive relationship was found, for a given grade, between total scores and length of time since leaving school. Item difficulties, based on the 1950 sample, showed almost no items to be either too difficult or too easy for the group tested. Discriminative values for items, figured separately for the three services in the 1950 sample, were consistent from one service to the other, and supported other measures of reliability for the test. It is recommended that standard scores be used without recourse to grade equivalents. Norms are presented as a 5-group scale and a stanine scale. (TIP abstract)

Dickson, E. D. D. 1952
and L. J. Wheeler
ULTRASONIC NOISE MEASUREMENTS IN A METEOR VII AIRCRAFT IN FLIGHT. — Flying Personnel Research Committee (Gt. Brit.). Report no. FPRC 805, Oct. 1952. 9 p. DSG (W1 qGR355). UNCLASSIFIED

The over-all noise spectrum in the range from 6 to 100 kc/sec. was determined in the cockpit of a jet aircraft in flight by means of a Dawe Ultrasonic Analyzer, and the sound pressure frequency distribution was analyzed. The results were recorded graphically. From the graphs it appears that the engine noise is but a small fraction of the over-all noise. Indeed, at 5,000 feet and at a speed of 0.7 Mach, the engine's contribution to the total noise spectrum can be

completely ignored. The "noises" measured are almost entirely aerodynamic in origin and the noise frequencies are relatively low. Adequate protection is afforded by the flying helmet.

Dietz, W. C. 1952
HIGH ALTITUDE B-36 CABIN PRESSURIZATION OPERATING EXPERIENCES. — S. A. E. Preprint, no. 757, 8 p. 1952. NNSAE

High-altitude problems are discussed from both the engineering and operational point of view and in their relation to cabin pressurization and the cabin air-conditioning system, as applied to the B-36 airplane. Structural aspects and physiological effects of high altitude flying are briefly reviewed. The cabin pressurization and oxygenation systems are described in detail.

Dinsmore, R. A. 1952
and P. H. DuBois
A PRELIMINARY STUDY OF LEARNING IN THE B-50D FLIGHT SIMULATOR. —Human Resources Research Labs., Bolling Air Force Base, D. C. HRRL Memo report no. 26, July 1952. v+18 p. (TIP U25310). PB 108073

The training records were analyzed for 47 crews trained in the B-50D flight simulator at Walker Air Force Base. Of these 24 had completed the basic and 23 the advanced course. To measure the degree of learning, the crews, flight engineers, and aircraft commanders were rated on the following tasks: accomplishment of standard check lists, basic flying techniques, emergency procedures, procedures for engine fires and failures, crew coordination, and general crew teamwork. When omissions of entire lists were considered as single errors, the check-list errors by flight engineers decreased during this simulated training. The errors by aircraft commanders remained about the same. In the advanced course there was considerable improvement in basic flying techniques, but this was not true in the basic course. The simulator instruction was effective in developing greater competence in handling simulated emergencies. Crew-coordination scores improved for aircraft commanders but not for flight engineers. The crews in the advanced course showed rapid increases in both teamwork and the handling of engine fires and failures; those in the basic course increased only in the latter. It was recommended that the training gains in the simulator be compared with proficiency gains in the aircraft to determine how the simulators can be best utilized. (TIP abstract)

Diringshofen, H. von 1952
[MODERN CONCEPT OF THE DUTIES OF THE FLIGHT SURGEON] El concepto moderno de la función del médico aeronaútico. — Día médico (Buenos Aires), 24 (81): 2125-2126. Nov. 27, 1952. In Spanish. DSG

The modern flight surgeon should endeavour to gain insight into the psychological problems of the pilot under his care and to win his personal confidence. Only on the basis of such an intimate personal relationship will he be in a position of performing his medical duties successfully.

Doane, B. K. see Dickie, R. D., 1952
Dobeln, W. V. see Wiesinger, K., 1952
Dodge, J. M. see Groot, S. G. de, 1952

Döbeln, W. von 1952
[LEAK DETECTOR: OPERATIONAL TEST OF AN APPARATUS TO DETERMINE LEAKAGE IN THE DEMAND-TYPE OXYGEN MASK] Leak detector: funktionsprövning av apparat för fastställande av läckage i syrgasmask typ Demand. — Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 1952 (1): 13-14. 1952. DSG

Three methods of determining leakage in oxygen masks are briefly described: (1) a method devised by Scholander (U. S. Air Force) consists in extracting gas samples from the inside of the rubber mask by means of a hypodermic needle and analyzing them quantitatively for oxygen and carbon dioxide contents by conventional gas-analytical methods; (2) a method designed by Fry is basically the same as the first, the only difference being that 0_2 and CO_2 are determined separately (instead of by deduction); and (3) a mechanical leak indicator, likewise developed by the U. S. Air Force, consists basically of a bellow-shaped attachment to the mask, which expands in case of a leak when the wearer holds his breath. If this third device is used with the British oxygen masks, it is necessary to shut off the air intake valve before applying the test. Introduction of the mechanical leak detector (no. 3) in the Swedish air force is reccommended.

Doesschate, G. T. ten 1952
[DEPTH PERCEPTION] Diepte-onderscheidingsvermogen. — Aeromedica acta (Soesterberg, Netherlands), 1: 105-114. 1952. In Dutch, with English summary, (p. 114). DSG

"Monocular clues" of depth perception are discussed. The size of retinal images of well-known objects is pointed out as an important aid in correctly judging relative distances. It is suggested that all airports should display large and clearly visible geometric figures of standard size, to facilitate judging of distances for pilots of approaching planes.

Domanski, T. J. see Wells, J. G., 1952

Donneson, A. J. 1952
MEDICAL SERVICE IN THE AIR DEFENSE COMMAND. — U. S. Armed Forces Med. Jour., 3 (2): 263-265. 1952. DSG (W1 UN3318, v. 3)

Providing medical care for Air Force personnel in installations ranging from fully staffed hospitals to isolated dispensaries, is the principal duty of the Medical Service in the U. S. Air Defense Command. The rapid expansion of the De-

fense Command has created shortages and situations where the assistance of unexperienced personnel had to be enlisted. An intensive on-the-job training program was initiated to releave the situation. Training cadres were established and rotated through various bases. The difficulties of providing medical service under the newly created Aircraft Control and Warning Program with its widespread net of radar warning stations, are described. Assignment of helicopters to certain air divisions for purposes of evacuation of patients and to furnish supplies under emergency conditions (e.g., to outlying, snow-bound stations) has been recommended.

Downey, V. M. 1952
and B. A. Strickland
AIR TRANSPORTATION OF CARDIAC AND PULMONARY PATIENTS. — Ann. Internal Med., 36 (2): 525-535. 1952. DSG

The study is based on an analysis of 1,777 flights of patients suffering from cardiac and pulmonary disorders, undertaken by the U. S. Military Air Transport Service (MATS) during 1949. All flights were carried out at altitudes below 10,000 feet. Only 4 out of 464 patients with cardiac diseases (less than 1%) showed any symptoms related to the patient's disease—a circumstance which contradicts the generally accepted practice of excepting such patients from air transportation. Of the patients with pulmonary disorders other than tuberculosis, 2.4% only (of a total of 568) showed related symptoms; and 2.7% of the pulmonary tuberculosis patients (of a total of 745 exhibited moderate related symptoms. Transportation by other means than airplane is advised for moribund patients. Oxygen therapy may be indicated during flight in the case of patients with cardiac and pulmonary disorders under emergency conditions.

Doyle, J. T., 1952
J. S. Wilson, and J. V. Warren
THE PULMONARY VASCULAR RESPONSES TO SHORT-TERM HYPOXIA IN HUMAN SUBJECTS. — Circulation, 5 (2): 263-270. 1952. DSG

A group of 8 normal subjects breathing an air mixture containing 10% oxygen for about 10 minutes, showed rapid reduction of the arterial O_2 saturation to about 75%, causing a considerable increase in pulmonary vascular resistance and in cardiac output. This is attributed to the effect which the low oxygen tension of the returning venous blood has on the walls of the pulmonary arterioles; the increase in cardiac output is a compensatory reaction. The pulmonary blood volume did not change during anoxia. The same experiments were repeated on a group of subjects affected with cardiopulmonary disturbances. Among the deviations from the normal group observed were the following: smaller increase in pulmonary vascular resistance and no increase in the cardiac output.

Doyle, J. T., 1952a
R. A. Lee, and E. B. Kelley
OBSERVATIONS ON THE ELASTICITY OF THE PULMONARY VASCULATURE IN MAN. — July 25, 1952. 5+5 p. Emory Univ., Atlanta, Ga. (Contract N9onr-92500); and Naval School of Aviation Medicine, Pensacola, Fla. (Proj. report no. NM 001 050.01.06). (DSG)
UNCLASSIFIED

An analysis of the relationship between the mean circulation time through the pulmonary circuit and the rate of blood flow permits tentative deductions concerning the elastic properties of the pulmonary vasculature. It is concluded that at resting flow rates of blood flow in normal individuals the pulmonary vasculature behaves as a simple elastic system. At high flow rates the pulmonary vasculature behaves more nearly like a rigid system, while at very low flow rates the data suggest overstretching of the walls of the heart. A more direct approach to this problem will be possible when it becomes feasible to make rapid serial measurements of the pulmonary blood flow.

Dreyfus, C. 1952
[ANOXIA AND BLOOD] Anoxie et sang. — Bulletin de la fédération des sociétés de gynécologie et d'obstétrique de langue française (Paris), 4 (1 bis): 270-271. 1952. In French. DSG

Studies on the correlation between anoxia and erythropoiesis are briefly reviewed and various theories on the underlying physiological mechanism compared.

Duane, T. D., 1952
R. L. Wechsler, J. E. Ziegler, and E. L. Beckman
STUDIES ON CEREBRAL PHYSIOLOGY OF MONKEYS AT 12 NEGATIVE G. — Jour. Aviation Med., 23 (5): 479-489, 544. 1952.
DLC (TL555.A1A4, v. 23)

Anesthetized healthy monkeys (Macaca mulatta) with lucite calvaria, were subjected to 12 negative g on a centrifuge while various physiological measurements were taken. Repeated exposures of 40 seconds each resulted in cerebral edema and in subcutaneous and submucosal hemorrhages in the head and neck region, but were not fatal to the animals. At -12 g, cerebral circulation continued at a somewhat slower rate compared to unexposed controls (9.4 and 7.1 seconds, respectively). During maximum g, respiratory movements ceased but were resumed spontaneously 15 seconds after completion of exposure. While there was a decrease in the cerebral arteriovenous difference during negative g, this difference rose above the pre-run level 10 minutes after the experiment. The electroencephalogram revealed a trend toward progressive depression, with individual variations. The arterial and venous pressures increased but the pressure gradient decreased severely during stress. Bradycardia and high T wave were both suggestive of severe anoxia.

Duane, T. D., 1952a
R. L. Wechsler, J. E. Ziegler, and
E. L. Beckman
STUDIES ON CEREBRAL PHYSIOLOGY OF MONKEYS AT 12 NEGATIVE g. — Amer. Jour. Med. Sci., 224 (1): 112. 1952.
DSG

Cerebral circulation, respiration, blood gases, and vascular pressure gradients across the brain were measured on monkeys exposed to 12 negative g for 40 seconds. Electroencephalogram and electrocardiogram were also recorded. The findings were as follows: (1) cerebral circulation continued throughout the experiment; (2) apnea set in with secondary arterial anoxemia and a lowering of the cerebral venous oxygen content, indicating cerebral anoxia; (3) arterial and venous pressures were elevated, but the arterio-venous pressure gradient decreased severely during the stress; (4) cardiac irregularities were observed, suggesting cardiac anoxia; and (5) the cerebral venous oxygen content failed to return to the original level after the experiment, indicating a disturbed cerebral metabolism or decreased cerebral blood flow.

Duane, T. D., 1952b
R. L. Wechsler, J. E. Ziegler, and
E. L. Beckman
EFFECTS OF ACCELERATION UPON THE CEREBRAL METABOLISM AND CEREBRAL BLOOD FLOW. PHASE II. STUDIES ON CEREBRAL PHYSIOLOGY OF MONKEYS AT 12 NEGATIVE G. — Naval Air Development Center. Aviation Medical Acceleration Lab., Johnsville, Pa. Report no. NADC-MA-5204, May 21, 1952. iv+51 p. (Project report no. NM 001 060.03.03; TIP U22708). UNCLASSIFIED

Essentially the same as the paper, Duane, T. D., 1952, with additional illustrative material.

DuBois, E. F. 1952
SAFETY BELTS ARE NOT DANGEROUS. — Brit. Med. Jour. (London), 685-686. Sept. 27, 1952. DSG

The once wide-spread belief that 1,000 lb. safety belts cause internal injuries in the case of crash, has been refuted by the efforts of the Crash Injury Research unit of the Cornell University Medical College (New York City). An analysis of the crash of a Viking aircraft, on October 31, 1950, at London Airport, and a tabulation of autopsy findings,, showed complete absence of abdominal injuries. Almost all safety belts and seat anchorages had broken at the very first impact. In other accidents, where even stronger belts than in the Viking had been used, hardly any evidence of belt injuries was found, as the 858 crash analyses show.

DuBois, P. H., 1952
J. Loevinger, and G. C. Gleser
THE CONSTRUCTION OF HOMOGENEOUS KEYS FOR A BIOGRAPHICAL INVENTORY. — May 1952. 19 p. Washington Univ., St. Louis, Mo. (Contract AF 33(038)-10588); issued by Air Training Command. Human Resources Research Center. Personnel Research Lab., Lackland Air Force Base, Tex. Research bulletin no. 52-18 (Project no. 503-001-0011) (TIP U23348). PB 107279

A method is presented for constructing homogeneous independent keys for a biographical inventory. The method is based on analysis of inter-item covariances, and appears to maximize the discriminating power of the resultant multiple-score test. Each key is constructed by adding items one at a time to 3 items so as to maximize the saturation with respect to the matrix of items from which the key is drawn, where saturation is the proportion of the total test variance due to inter-item covariances. A cycling process involving elimination and addition of items is followed to assure an adequate degree of independence to the keys. Biographical Inventory BE601B yielded the following keys: mechanical, radio, clerical, security-routine, response set, supervisory, handyman, extroversion (?), and education. Saturations of the keys ranged from 0.42 to 0.78 for a standardization sample (SS) of 1000 airmen, and from 0.37 to 0.76 for a cross-validation sample (CVS) of 991 airmen. The mean of the absolute values of the intercorrelations of the keys was 0.15 for SS and 0.14 for CVS. The multiple correlations for predicting 7 AF empirical or criterion keys from the 9 homogeneous keys ranged from 0.63 to 0.85 for SS. The CVS yielded values from 0.57 to 0.83 for the correlation of predicted empirical key and actual value. (TIP abstract)

DuBois, P. H. see also Dinsmore, R. A., 1952
Ducros, E. see Placidi, T., 1952
Dugal, L. see Fortier, G., 1952

Duguet, J. 1952
and A. Mercier
[MODIFICATIONS IN PUPIL SIZE IN ANOXIA] Les modifications de l'aire pupillaire en anoxie. — Médecine aéronautique (Paris), 7 (4): 433-436. 1952. In French. DLC (TL555. M394, v. 7)

Pupillary dilatation and contraction were measured in 20 subjects (age, 19-33 years) exposed to hypoxia in a decompression chamber. Tests were carried out by a photographic process on the dark-adapted and light-adapted eye in four phases: at ground level, at a simulated altitude of 6,000 m. [19,700 ft.], after inhalation of oxygen for 5 minutes, and again when reaching ground level. — Results of all four phases of the test are tabulated; it seems that in the dark-adapted eye in the state of rest, pupillary contraction is the primary reaction to anoxemia. In the light-adapted eye, however, in which the pupil is contracted, dilatation occurs. No relation could be established between hypoxemic pupillary reaction and altitude tolerance. Pupillary reaction is apparently a complex process involving the tonus of the iridomotorial nervous centers and a local chemical reaction of acid metabolites modifying the function of the mediators.

Duguet, J. 1952a
[HYGIENE ON AIRPLANES] L'hygiène à bord des avions. — Médecine aéronautique (Paris), 7 (2): 99-174. 1952. In French.
DLC (TL555.M394, v. 7)

The following hygienic factors in aviation are discussed in detail: ventilation, heating, humidity control, refrigeration, gasoline and other toxic vapors, protection against noise, water and food supply, disposal of refuse and waste materials, disinfection and disinsectization of cabins, sanitary regulations of aerial traffic, international sanitary agreements, sanitary measures to be applied to passengers, international vaccination practices, and danger of epidemic and tropical diseases.

Duguet, J. 1952b
PRACTICABILITY OF CONTACT LENSES FOR PILOTS. — Jour. Aviation Med., 25 (5): 477-478, 544. 1952.
DLC (TL555.A1A4, v. 23)

The use of plastic contact lenses would appear to be ideal in aviation since glasses constitute a potential danger. The advantages of contact lenses are: they follow all ocular movements; optical defects occurring during lateral eye movements with normal glasses are suppressed; and they are shock proof. The fact that these lenses are not too often used by ametropic fliers is due to their disadvantages: under reduced barometric pressure, air bubbles are formed between the cornea and the contact lense; when exposed to sunlight, less ultraviolet radiation is absorbed than by ordinary glasses; windblast presses the contact lenses too closely to the eye. The average tolerance for contact lenses is 2.9 hours, a period obviously too short for fliers. When the tolerance limit is reached, great discomfort and blurring of the vision are experienced.

Duguet, J. 1952c
[AVIATION MEDICINE IN 1950-51] La médecine aéronautique en 1950-51. — Maroc médical (Casablanca), 31 (325): 514-520. 1952. In French. DSG

The progress made in the field of aviation medicine in the period of 1950-1951 is reviewed. The most outstanding studies pertaining to transportation of patients, oxygen equipment, and the influence of altitude on the effect of drugs and therapeutics, are summarized.

Duguet, J. see also Mercier, A., 1952

Duke, H. N., 1952
J. H. Green, and E. Neil
CAROTID CHEMOCEPTOR IMPULSE ACTIVITY DURING INHALATION OF CARBON MONOXIDE MIXTURES. — Jour. Physiol. (London), 118 (4): 520-527. 1952. DLC (QP1.J75, v. 118)

Tests were carried out on cats anesthetized with chloralose (50 mg./kg.) and urethane (250 mg./kg.) intraperitoneally. A tracheal cannula was connected to an inspiratory valve through which gas mixtures were administered. Arterial blood pressure was measured by connecting the carotid artery to a monometer. The gas content of the blood was determined from blood samples withdrawn from the femoral artery. — When the animals inhaled 1 or 2% CO mixtures in air, no excitation was noted in the electroneurogram of the chemoreceptor nerve fibers of the carotid sinus until the CO saturation of the blood exceeded 75-80%; when the experiment was prolonged and the carboxyhemoglobin level reached more than 80%, respiration became depressed and finally ceased. When the CO mixtures were inhaled in oxygen, the results were the same as in the previous experiment except for the following modifications: (1) the formation of carboxyhemoglobin was retarded, and (2) the O_2 content of the arterial blood increased and the animal maintained spontaneous respiration even when the carboxyhemoglobin saturation was as high as 90%. When the animals were first breathing 2% CO in O_2, then were switched to 5% O_2 in N_2, a reduction of the O_2 tension of the blood and a marked chemoreceptor discharge occurred.

Duncan, C. P. 1952
and B. J. Underwood
RETENTION OF TRANSFER IN MOTOR LEARNING AFTER 24 HOURS AND AFTER 14 MONTHS AS A FUNCTION OF DEGREE OF FIRST-TASK LEARNING AND INTER-TASK SIMILARITY. — Oct. 1952. 22p. Northwestern Univ., Evanston, Ill. (Contract AF 33(038)-11396; issued by Wright Air Development Center, Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-224. (RDO no. 694-44) (AD 3247).
PB 108919

Retention of a transfer task provided on a self-paced discriminative motor device was studied as a function of degree of learning of the training task and similarity between tasks. Retention of the transfer task was measured after 24 hours and again after 14 months following acquisition. — There was some forgetting over 24 hours but in relearning the positive transfer obtained during acquisition of the transfer task continued to be manifest and to vary directly both with degree of first-task learning and with task similarity. Proactive facilitation of retention was obtained. — Forgetting over 14 months was great and showed evidence for differential proactive inhibition as a function of degree of learning. Relearning proceeded relatively rapidly. Performance during relearning varied directly with degree of first-task learning but did not vary with inter-task similarity. (Authors' abstract)

Duncombe, A. 1952
A REVIEW OF RESEARCH ON PSYCHIATRIC SCREENING FOR THE ARMED FORCES. — Research and Development Board. Committee on Human Resources, Washington, D. C. Report no. HR 202/1, Sept. 1, 1952. 21 p. (TIP U25571).
PB 108324

A review is presented of projects under government contract on the topic of psychiatric screening and related subjects. The projects are are outlined briefly as to scope, methods, and results. A bibliography is attached, containing 114 references, listing published studied in the field of psychiatric screening for the years 1942 through 1951 (as reported in Psychological Abstracts).

Dunker, E. see Gollwitzer-Meier, K., 1952

Dunnahoo, G. L. 1952
LEGAL ASPECTS OF AIR TRANSPORTABILITY OF THE SICK. — Jour. Aviation Med., 23 (1): 3-9, 18. 1952. DLC (TL555.A1A4, v. 23)

Discusses the restrictions imposed upon the air travel of passengers with communicable diseases and passengers embarking in foreign areas where they may have been exposed to "quarantinable" diseases (smallpox, yellow fever, epidemic typhus, cholera, plague). Regulations concerning foreign and interstate quarantine and military aircraft transportation, and provisions of the U. S. Immigration Act and Air Commerce Act are summarized.

Durante, U. 1952
[NEW SOCIAL PROBLEMS IN AERONAUTICS IN RELATION TO THE NEW CHART OF OCCUPATIONAL DISEASES] Nuovi problemi sociali nell' aeronautica in rapporto alla nuova tabella delle malattie professionali. — Rivista di medicina aeronautica (Roma), 15 (3): 411-418. 1952. In Italian, with English, French, Spanish, and German summaries (p. 417-418). DSG

The applications of the Chart of Occupational Diseases set up by the Italian government, to the aviation industry are discussed. The Chart lists the various occupational diseases, substances causing pathological conditions, branches of the industry manufacturing these substances, and periods of compensation to be applied in the various cases of illness. The advantages gained by both the civilian and military aviation personnel are noted.

Dustin, E. [H.] and G. [L.] Maison 1952
RESPIRATORY ARREST IN RABBITS EXPOSED TO HYPOXIA AFTER DIBENAMINE. — In: Bauer, R. O. and others, The effects of drug-induced alternations ..., p. 1-3. Wright Air Development Command. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-222, June 1952 (RDO no. 696-61) (ATI 171 952). UNCLASSIFIED

This is a reprint of the paper, Dustin, E., 1948 (Proc. Soc. Exper. Biol. and Med., v. 67 (4): 435-437). Dibenamine was administered through the marginal vein of the ear of rabbits over a period of one minute. The animals were then exposed to a hypoxic atmosphere (5% oxygen in helium) for five minutes. Whenever respiratory arrest occurred, artifical ventilation was established after one to two minutes of apnea. After an average exposure of 158 seconds the respiration became more labored. This phase was followed abruptly by an apparently tonic contraction of the diaphragm, accompanied by twitching movements of the abdomen. Finally the respiratory tidal volume fell to zero and the tonic contraction faded out. Susceptibility to respiratory arrest lasted until 20 to 40 minutes after administration of the drug.

Dustin, E. H. see also Bauer, R. O., 1952; Maison, G. L., 1952

Duvoisin, G. see Sleight, R. B., 1952a

Dyme, H. C. see Hill, J. C., 1952; Jackson, M. M., 1952

E., E. 1952
[ORIENTATION OF CREWS IN THE PRESERVATION OF PHYSICAL AND MENTAL POWERS] Orientation destinée aux equipages concernant le maintien des capacités physiques et psychiques. — Bulletin international des services de santé des armées de terre, de mer et de l'air (Liège), 25 (11): 538-539. 1952. In French. DSG (W1 BU666, v. 25)

A memorandum is summarized, circulated by the commanding officer of the Swiss Air Force among his troops, containing instructions on physical and mental care. A minimum of 7 to 8 hours of of sleep is needed to give the body sufficient rest. Abstention from tobacco and alcohol is mandatory for reasons of safety. In habitual smokers, 5-10% of the total output of hemoglobin is excluded from its oxygen-carrying function, and the toxic effects of nicotine impair the normal neuro-vegetative, ophthalmic, cardio-vascular, and psychological functions.

Eckstrand, G. A. see Biel, W. C., 1952

Edelberg, R. 1952
TUMBLING. — [Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio.] [1952]. 3 p. [Paper presented at Conference on "Problems of Emergency Escape in High Speed Flight", Sept. 29-30, 1952, at Wright-Patterson Air Force Base, Ohio] (AD 14346). UNCLASSIFIED

Tumbling motions were simulated on a turntable capable of speeds up to 200 r.p.m. Speeds of 100 r.p.m. did not produce unconsciousness in human test subjects when the center of rotation was located at the lower portion of the heart. Above 100 r.p.m., pain was perceived and hemorrhages occurred, but mental and physical performance remained unimpaired. Experiments with dogs showed that the impairment of the circulation becomes less at any given speed as the center of rotation is moved toward the lower abdomen. Human experiments with the center of rotation at the level of the abdomen are in progress. From the dog experiments it appears desirable that the center of rotation be applied at heart level for short-duration spins. Since production of vertigo

is contingent on stimulation of the semicircular canals by some changing force, at spins of constant rate no vertigo is experienced because the radial forces are constant. The resulting sensation is that of being in a strong gravitational field acting toward the head and feet at the same time, rather than one of being rotated. A "strength-duration curve for human tolerance" indicating threshold values for conjunctival hemorrhage is presented.

Edelmann, A. 1952
and F. A. Hitchcock
OBSERVATIONS ON DOGS EXPOSED TO AN AMBIENT PRESSURE OF 30 mm Hg. — Jour. Applied Physiol., 4 (1): 807-812. 1952.
DSG (W1 J0544, v. 4)

Dogs were explosively decompressed from ground-level pressure to 30 mm. Hg and remained at this low pressure up to 240 seconds. Hyperventilation and abdominal distension were observed, followed by collapse and mild convulsions, after which the animals became quiet and gasped for 30 seconds. Other symptoms observed were lacrimation, profuse salivation, urination, projectile vomiting, and defecation. Between 30 and 40 seconds after decompression, a swelling was observed in the hind limbs and abdomen, progressing headward until the entire skin area and the tongue were affected. Upon recompression to 55 mm. Hg the swelling suddenly receded. Only the dogs exposed to low pressure for less than 30 seconds resumed respiration immediately after return to atmospheric pressure. In all but two dogs exposed to low pressure for less than 4 minutes, heartbeat was discerned. All living dogs resumed respiration 30 seconds after return to atmospheric pressure. They showed a temporary absence of corneal reflexes and a transient condition of decerebrate rigidity. They regained consciousness spontaneously 10 minutes after return to ground-level pressure.

Ederstrom, H. E. see Higginbotham, A. C., 1952

Edwards, T. M. 1952
and W. D. Howell
A STUDY OF PILOTS' EYE MOVEMENTS DURING VISUAL FLIGHT CONDITIONS. — Civil Aeronautics Administration. Technical Development and Evaluation Center, Indianapolis, Indiana. Technical development report no. 179, June 1952. 23 p. DCAA

Motion picture photographs were taken of pilots' eyes and heads while they performed critical maneuvers with aircraft during daytime visual flight conditions. Three motion picture cameras were used simultaneously. Two of these recorded the pilot's eye movements through a system of mirrors, the third photographed the horizon out ahead of the airplane. Basic references or fixation points were established for pilot eye positions by selecting definite locations on the windshield and photographing the pilot's eyes while they were fixed on those selected locations while flying. The motion pictures were analyzed frame by frame to determine which portions of the windshield and windows were being used and how much each section was being used. The areas on the windshield that show high percentages of usage are generally the areas through which the pilot is obtaining visual cues necessary to operate the aircraft and not the areas of the windshield which are used to search the air space for other aircraft. (From the authors' summary)

Eldredge, D. H. see Covell, W. P., 1952; Gierke, H. E. von, 1952b
Ellner, P. D. see Gee, A. H., 1952a
Emerson, G. A. see Clements, R., 1952

Emerson, G. O. 1952
PILOT VISION FROM THE PRONE POSITION IN FIGHTER AIRCRAFT. — Jour. Aviation Med., 23 (6): 608-611. 1952.
DLC (TL555.A1A4, v. 23)

Prone position of the pilot of a fighter aircraft would enable him to withstand greater g forces; an aircraft built around the prone position could also be more efficient structurally and aerodynamically. The characteristics of the visual field of the pilot in prone position were studied. Three types of visual field may be distinguished: the foveal rotational field (the area in which an object may be brought on the fovea by movements of the eyes), the peripheral rotational field (the total perceptual area which may be reached by eye movements), and the area which may be perceived by rotation and angulation of the head. The sum of the two monocular foveal fields was found to be nearly the same as the binocular foveal field; the sum of the monocular peripheral fields, however, exceeded the binocular peripheral field. — Fatigue which develops in upward gaze is greatly reduced when there is a frequent downward gaze to the instruments. — The visual field in prone position is sufficient for non-combat flying; its deficiencies in combat flying may be remedied with optical equipment (mirrors, periscope).

Enoch, J. M. see Alluisi, E. A., 1952; McGraw, J. L., 1952

Erdbrink, W. L. 1952
THE RESERVE AVIATOR. — U. S. Navy Medical News Letter, 20 (12): 32-36. 1952.
DSG (W1 UN598, v. 20)

A statistical analysis undertaken by the author during the first half of 1952 to determine age levels, educational and professional background, flying experience, etc. of pilots who had flown daily combat flights in Korea, revealed the following facts: (1) of the 106 pilots contacted, 69 were recalled naval reserve officers (the so-called "weekend warriors"); (2) attrition of the group throughout the 11-month training and combat period, because of death, psychological factors, injuries, and illness, was exceptionally low (17); (3) the average "weekend warrior" of this group

was a married, 29-year-old naval lieutenant, father of one child, and had three and one half years of college; he had served for about 4 1/2 years as an officer, and had flown a total of 1,660 hours, including 118 flying hours in combat (World War II); he had received various decorations and had had at least one major accident, without suffering major injuries; and (4) performance of this group was equal to any other Navy air group operating in Korea. It is concluded that strong motivation, love for flying, maturity, and experience account for the superior performance and high safety record of this group.

Ericksen, S. C. 1952
DEVELOPMENT OF A LIGHT PLANE PROFICIENCY CHECK TO PREDICT MILITARY FLYING SUCCESS. — Nov. 1952. v+45 p. American Inst. for Research, Pittsburgh, Pa. (Contract AF 33(038)-23183); issued by Air Training Command. Human Resources Research Center. Pilot Training Research Lab., Goodfellow Air Force Base, Tex. Technical Report no. 52-6 (Project no. 508-016-0003) (AD 1188). PB 108688

A light-plane flight check for use in assessing the utility of a preprimary light-plane training course is reported. The maneuvers used in the flight check were tailored in terms of flying the T-6 aircraft. The flight check format, a manual of instructions for administering the flight check, and an analysis of the difficulty level of the items within the flight check are included as appendixes. (AD abstract)

Ericksen, S. C. 1952a
A REVIEW OF THE LITERATURE ON METHODS OF MEASURING PILOT PROFICIENCY. — Aug. 1952. iii+24 p. American Inst. for Research, Pittsburgh, Pa. (Contract AF 33(038)-23183); issued by Air Training Command. Human Resources Research Center. Pilot Training Research Lab., Goodfellow Air Force Base, Tex. Research bulletin 52-25 (Project no. 508-016-0003) (TIP U24454). UNCLASSIFIED

A summary is given of the research contributions toward problems of proficiency measurement at different levels of flying training or in specialized pilot tasks. The review covers pre-World War II studies, evaluation studies of subjective measures of pilot proficiency, and systematic research toward the development of objective measures of pilot proficiency. 53 references. (TIP abstract, modified)

Eugster, J. 1952
[METHOD TO PROVE THE BIOLOGICAL EFFECTS OF COSMIC RADIATION AT HIGH ALTITUDES] Methode zum Nachweis der biologischen Wirkung der kosmischen Strahlung in grossen Höhen. — Weltraumfahrt (Frankfurt), 1952 (2): 42-46. 1952. In German.
DLC (TL789.W45, 1952)

Eggs of Artemia salina and specimens of freshly excised human and animal skin were exposed to cosmic radiation at an altitude of about 30,000 m. The eggs were placed on a metal grid sandwiched between photographic emulsion layers, while the skin specimens were injected with a photosensitive emulsion (Ilford G5). The surrounding temperature was kept constant by means of a thermostat and thermo-insulation (thermos bottle). Balloons were used as carriers. While an exact quantitative evaluation of the experiment is still pending, the effect of cosmic radiation could be proven beyond doubt. Part of the Artemia eggs had been killed by direct "hits", and corpuscular tracks were clearly visible on the processed skin specimens.

Evans, T. C. 1952
A DISCUSSION OF THE POTENTIAL EFFECTS ON MAN OF IONIZING RADIATION PRESENT IN THE UPPER ATMOSPHERE. — In: Physics and medicine of the upper atmosphere: a study of the aeropause, p. 533-539. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico Press, 1952. DLC(RC1050.U5, 1952)

Assuming that the relative biological effectiveness of protons amounts to 10 times that of X- or gamma rays, the maximum cosmic-ray exposure to be expected in the upper atmosphere would be about 0.15 roentgen equivalent man (rem) units — too low to have immediate or direct lethal effects. Animal experiments have shown, however, that continuous or repeated exposures to this radiation intensity are hazardous. As compared to X-ray doses of identical intensity, the exposures were about 5 times as effective in producing gonadal injury and damage to the lens of the eye in mice. Neutrons were found to be more effective than X-rays in producing a certain type of chromosome damage in the cellular division of Tradescantia. It was concluded that a single neutron event, because of its high specific ionization, is capable of producing the same chromosome damage that would result from two or more photon events in X-ray or gamma-ray exposures. Studies dealing with other applications of neutron radiation are briefly reviewed.

Evrard, E. 1952
[APPLICATION OF THE STEP TEST TO THE PERIODICAL MEDICAL CONTROL OF AVIATORS] Application du step-test à la sélection et au contrôle médical périodique des aviateurs. — Médecine aéronautique (Paris), 7 (4): 375-393. In French. DLC (TL555.M394, v. 7)

A total of 1516 candidates for aviation training and pilots in training, and 41 jet fighter pilots of the Belgian Air Force were tested for physical endurance. The step test was applied, consisting of climbing up and down a 51 cm [1.64 ft.] high bench every two seconds. A "physical fitness index" is derived based on the duration of the exercise and the pulse rate measured at three intervals after completing the exercise. — Experience has shown that it is not advisable in pilot selection to consider any candidate below a physical fitness index of 70, although all of them raised

their index above 70 soon after they had started their training. For jet plane fighters above 28 years of age the author recommends the Master or two-step test, consisting of repeated mounting and descending of two steps for 90 seconds, in order to correlate the intensity of exercise to age and to get more specific information on the function of the heart.

Evrard, E. 1952a
[A NEW TEST OF INDUCED DISORDER OF EQUILIBRIUM: APPLICATION TO THE SELECTION OF AVIATORS AND TO THE STUDY OF AIRSICKNESS] Une nouvelle épreuve de deséquilibration provoquée: application à la sélection des aviateurs et aux recherches sur le mal de l'air. — Médecine aéronautique (Paris), 7 (4): 399-410. 1952. In French. DLC (TL555. M394, v. 7)

A total of 1200 pilot candidates were subjected to an equilibrium test: blindfolded, they were seated on a rotating chair and exposed to 8 rotations in 10 seconds; the instant the rotation stopped, they were requested to assume the Romberg position. With regard to the time necessary to regain balance the candidates reacted as follows: 6-15 seconds, 0.75% (subjects of subnormal excitability level); 16-60 seconds, 90.5% (normal subjects), and above 60 seconds, 8.75% (hyperexcitable subjects). 90% of the members of the last group were victims of air sickness since the onset of their flight training. When the same test was given to 86 jet-plane aviators, they needed 11-50 seconds to regain their balance; 90% of them regained it in 21-40 seconds. — In 14 aviators who had at least 400 flight hours, an increase of stability of balance was noted, probably due to a decrease in labyrinthic sensitivity. The equilibrium test indicated an extended recuperation period in 60% of pilot candidates eliminated from training because of air sickness. In 40% the origin of this ailment seemed to be psychogenic (anxiety). The administration of 5 centigrams [50 mg.] of motion sickness remedies had the following effect on the reduction of recuperation time: Dramamine, 25-40%; Nautamine, 50-60%. The duration of the therapeutic effect was: Dramamine, 3-5 hours; and Nautamine, about 9 hours.

Evrard, E. 1952b
[APPLICATION OF THE "STEP-TEST" TO SELECTION OF AIRMEN AND TO EVALUATION OF THE DEGREE OF THEIR PHYSICAL FITNESS] Note complémentaire sur l'application du "step-test" à la sélection des aviateurs et à l'évaluation de leur degré de forme physique. — Annales belges de médecine militaire (Liège), 105 (1-2): 11-20. 1952. In French.
DSG (W1 AN3092, année 105, 1952)

While the "step-test", which has been designed chiefly to measure physical endurance, is no substitute for clinical examination, it has been found to be one of the most reliable test methods to determine physical fitness of aviation candidates. A score of 70 should be regarded as minimum requirement. Statistics show that candidates scoring between 70 and 80 have improved following rugged training, while those scoring over 80 were found prone to a slight lowering of their physical standards. University students, according to step test results, as a rule improved after undergoing physical training as aviation cadets. Morphological differences have to be taken into account when applying standards adopted by one national group to another (e.g., U. S. requirements to the Belgian air force).

Evrard, E. 1952c
and R. Mollet
[THE ROLE OF ATHLETIC TESTS AND PHYSICAL EXERCISES WITH REGARD TO PRINCIPLES GOVERNING MEDICAL AND PHYSIOLOGICAL SELECTION OF CANDIDATES FOR THE BELGIAN AIR FORCE] Le rôle des épreuves sportives et des exercices physiques dans la doctrine de sélection médico-physiologique des candidats aviateurs a la force aérienne belge. — Annales belges de médecine militaire (Liège), 105 (1-2): 30-38. 1952. In French.
DSG (W1 AN3092, v. 105)

With regard to circulation and respiration, the adaptive processes of the organism to flight are similar to those following intensive physical exercise. On this assumption a number of fitness tests have been devised, such as the Flack test in England, the Schneider test in the U. S., and the "step test" in Belgium. However, in applying foreign testing standards, racial differences are to be taken into consideration. Selection standards of the Belgian Air Force have to remain much more rigid than those of other services. In the choice of exercises one should be guided by the particular physiological demands of flying. A number of exercises are listed in systematic arrangement and are briefly outlined. An interest in sports and enjoyment of physical exercises on the part of the candidate are desirable, since physical training is to be kept up even after commencement of active flying.

Evrard, E. 1952d
[A NEW TEST OF INDUCED DISORDER OF EQUILIBRIUM: APPLICATION TO THE SELECTION OF AVIATORS AND TO THE STUDY OF AIRSICKNESS] Une nouvelle épreuve de deséquilibration provoquée: application à la sélection des aviateurs et aux recherches sur le mal de l'air. — Annales belges de médecine militaire (Liège), 105 (11-12): 193-204. 1952. In French. DSG (W1 AN3092, v. 105)

Same as the paper, Evrard, E., 1952a.

Falconnet, P. see Placidi, T., 1952
Falet see Mases, 1952

[Farnsworth, D.] 1952
NAVY'S NEW RESCUE COLOR. — Picture (St. Louis Post-Dispatch), March 9, 1952: 1. 1952. DLC

See Berg, P., 1952.

Farnsworth, D. see also Sexton, M. S., 1952

Feinstein, R. N. 1952
and J. C. Ballin
BIOLOGICAL AND MEDICAL ASPECTS OF IONIZING RADIATION. CARBOXYPEPTIDASE IN MAMMALIAN TISSUE. — Dec. 1952. iii+6 p. Univ. of Chicago, Ill. (Contract AF 33(038)-27353); and School of Aviation Medicine, Randolph Field, Tex. (Project no. 21-47-005, Report no. 6) (TIP U26250 and ATI 188462). PB 108278

The objective of this study was to investigate, in normal animals, the biochemistry of an enzyme-enzyme inhibitor system which has been found to be radiation sensitive. The following conclusions were reached: the proteolytic enzyme, carboxypeptidase, which splits chloracetyltyrosine at pH 5.5 with the liberation of acid groups and free tyrosine, has been found widely distributed in mammalian tissues. It has been found to occur in two forms, one of which is activated, the other inhibited, by cysteine. The reason for previous non-detection of this enzyme has been found to be the simultaneous occurrence in most tissues of an inhibitor of the enzyme. Enzyme and inhibitor may be separated by differential centrifugation and assayed separately. The inhibitor is apparently protein in nature. (Authors' summary, modified)

Ferraris de Gaspare, P. F. 1952
and B. Boles Carenini
[ON THE EFFECT OF TOBACCO AND OF ALCOHOL ON RETINAL SENSITIVITY DETERMINED WITH GOLDMANN'S ARTIFICIAL SCOTOMA; EFFECTS OF THEIR COMBINATION WITH ANOXIA] Dell' azione del tabacco e dell' alcool sulla sensibilità retinica rilevata con lo scotoma artificiale di Goldmann; effetti della loro associazione con l' anossia. — Rivista di medicina aeronautica (Roma), 15 (3): 388-399. 1952. In Italian, with English, French, Spanish, and German summaries (p. 398-399). DSG

The individual and combined effects of tobacco, alcohol, and anoxia were examined on 18 healthy subjects with Goldmann's artificial scotoma. The following conclusions were reached: Tobacco smoke alone has no particular effect on retinal sensitivity; in anoxia (5000 m. simulated altitude) it sometimes improves the impaired retinal function. Alcohol combined with anoxia has a more severe effect than either agent alone. The most serious impairment of retinal sensitivity is noted when a combination of tobacco smoking, alcohol, and anoxia is applied.

Ferris, C. see Strickland, B. A., 1952a

Fields, P. E. 1952
THE EFFECTS OF IONIZING RADIATION UPON PHYSICAL AND PSYCHOLOGICAL CAPACITIES IN VARIOUS SPECIES. I. THE EFFICIENCY OF THE SERIAL MULTIPLE VISUAL DISCRIMINATION APPARATUS AND METHOD WITH WHITE RATS. — School of Aviation Medicine, Randolph Field, Tex. July 1952. iii+13 p. (Project no. 21-47-003, Report no. 1; TIP U23253). UNCLASSIFIED

The apparatus for testing visual discrimination of white rats comprises 5 multiple-stimulus units (Jour. Compar. Psychol., 20:183-203, 1935) connected in serial combination. In order to obtain food, the rats must jump an 8-in. gap in each unit to a platform delineated by a set of black-and-white lines differing in size or number from those on other platforms. Automatic switches on the platforms of each unit operate clocks which time the total problem-solving activity. Handling the animals is reduced to a minimum by providing wire mesh ladders and paths for the rats to return to the correct platforms. It is possible to obtain data on 5 different problems from individual rats at better than the 1% confidence level. With one problem, the probability of getting all correct responses in the same 5 trials is 3×10^{-17}. Various combinations of brightness, acuity (size), matching (tuitional control), simple multiple choice (position), and absolute vs. relative discrimination problems can be tested simultaneously. (TIP abstract)

Fintak, F. F. see Rodewald, F. A., 1952

Fitts, P. M. 1952
MEN AND MACHINES--THE DESIGN OF EQUIPMENT FOR EFFICIENT HUMAN USE. — Eng. Exper. Station News, Ohio State Univ., 24 (5): 6-10. 1952. DLC (TA401.05, v. 24)

Part of this general survey of the history and scope of human engineering is dedicated to the "knobs-and-dial-problems" as related to cockpit instrumentation design. The modifications of the old three-pointer-type altimeter (in favor of the one-pointer dial for 1 to 10 miles distances and a counter-type indicator for tens and hundreds of miles) have introduced extended research activity on related instruments.

Fitts, P. M. 1952a
and C. W. Simon
THE ARRANGEMENT OF INSTRUMENTS, THE DISTANCE BETWEEN INSTRUMENTS, AND THE POSITION OF INSTRUMENT POINTERS AS DETERMINANTS OF PERFORMANCE IN AN EYE-HAND COORDINATION TASK. — Feb. 1952. iv+26 p. Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC AF Technical report no. 5832; and Antioch Coll., Yellow Springs, Ohio (Contract W33-038-ac-19816) (TIP U22090). PB 106818

Three experiments are reported in which the effects of various visual stimulus patterns formed by different arrangements of instruments and pointers were studied. For the task employed, which was a continuous, dual-pursuit problem, the results of all three experiments are in agreement in indicating that subjects give significantly superior performance when: (a) instruments are close together, (b) instruments are aligned hori-

zontally, and (c) pointers are aligned at 9 o'clock for horizontally separated instruments and at 12 o'clock for vertically separated instruments, or else the pointers are counterpoised. The results of an extended learning study indicated that differences in the initial performance of individuals when using the different pointer-position patterns actually increased during 15 daily practice sessions. (Authors' summary)

Fitts, P. M. see also Bahrick, H., 1952; Warren, C. E., 1952
Fleck, H. G. see Cibis, P. A., 1952d; Rose, H. W., 1952b
Fleming, E. S. see Zimmer, C. E., 1952

Flottorp, G. 1952
PURE-TONE TINNITUS EVOKED BY ACOUSTIC STIMULATION: THE IDIOPHONIC EFFECT. — Harvard Univ. Psycho-Acoustic Lab., Cambridge, Mass. Report no. PNR-130, [1952]. 31 p., 15 plates. (Contract N5ori-76, Task order 2; TIP U23607) UNCLASSIFIED

Listeners were subjected to (1) a short stimulus tone (about 1 sec. in duration) followed by 1 or 2 sec. of silence and/or (2) a continuous sinusoidal tone which the listener could interrupt manually. Some subjects perceived in addition to the stimulus pure tone an extra, evoked, tinnitus tone in the form of beats, roughness, or double tones which might be followed by a rapidly decaying aftertone after the stimulus tone was turned off. The pitch of this idiotone, or evoked tinnitus, was nearly unaltered by the frequency of the eliciting stimulus. The frequency corresponding to the idiotone was characterized by inability to elicit an an idiotone for any intensity, and this frequency was extremely stable, no change being found in 3 yrs. of experimentation. A correlation was found between an idiophonic effect and a localized threshold change, but no increase in resolving power seemed to accompany the idiotone. The idiophonic effect is postulated as supporting the theory of a time-consuming process in the cochlea (such as biochemical action in sensory elements and nerve cells) rather than that of high-tuned circuits. (TIP abstract)

Flottorp, G. 1952a
EFFECT OF DIFFERENT TYPES OF ELECTRODES IN ELECTROPHONIC HEARING. — Harvard Univ. Psycho-Acoustic Lab., Cambridge, Mass. Report no. PNR-131, [1952]. [33] p., [10] plates (Contract N5ori-76, Task order 2; AD 11 437). UNCLASSIFIED

Depending upon the kind of electrode system employed, a sinusoidal electric current gives rise to at least five phenomena: (1) When the electrode is immersed in salt solution in the ear (the most common method), the subject hears a complex tone, containing mostly second harmonic, suggesting the action of a square-law transducer. (2) When the electrode is in contact with the epidermis of the meatus, the subject hears the first harmonic, and at low frequencies he may also hear a noise. (3) When the electrode is on the mucous tissue inside the middle ear (with the eardrum removed), the subject hears the first harmonic and/or a noise. (4) With a large-area electrode any place on the skin of the head, if the skin is dry the subject hears the second harmonic; if it is wet, he hears nothing. (5) With a moving electrode on the skin or on the roof of the mouth (fricative effect), the subject receives the strongest sensation of hearing. He may hear either the first harmonic or the first and second harmonics, or the second harmonic alone, depending upon the applied voltage and upon the placement and the properties of the electrode. The experimental results seem to indicate that the hearing of a tone under any of those five conditions is probably due to vibrations set up outside the cochlea, although there appear to be at least four different transducing mechanisms. Contrary to earlier hypotheses the tympanic membrane is apparently not involved in the conversion of the electrical energy into mechanical vibration. (Author's abstract)

Flückiger, E. 1952
and F. Verzár
[LOWERING AND RESTITUTION OF BODY TEMPERATURE AT LOW ATMOSPHERIC PRESSURE AND THE EFFECT OF THYROID, PITUITARY, AND ADRENAL CORTEX ON IT] Senkung und Restitution der Körpertemperatur bei niedrigem atmosphärischem Druck und der Einfluss von Thyreoidea, Hypophyse und Nebennierenrinde auf dieselbe. — Helvetica physiologica acta (Basel), 10 (3): 349-359. 1952. In German, with English summary (p. 358-359). DSG

Rats exposed to low atmospheric pressure (350 mm. Hg) and "low" temperature (22-23°C) showed a drop of body temperature (4-5° C in about 3-4 hours), which was restored to normal in about 2 days of continuing exposure. When the animals, after restoration of the body temperature to normal, were returned to atmospheric pressure, their body temperature rose 1-1.5°C above normal for a few hours. If the surrounding temperature at low pressure was 27-29°C, no abnormal body temperature changes were observed. A group of thyroidectomized animals showed, however, lower body temperatures even under these latter conditions. Adrenalectomized or hypophysectomized rats restored their body temperature upon return to normal pressure only incompletely or not at all. The physiological mechanisms of the observed phenomena are discussed.

Foitzik, L. 1952
THEORY OF SLANT VISIBILITY. — Univ. of Texas. Optical Research Lab., Austin; issued by Armed Forces-National Research Council Vision Committee. July 1, 1952. 21+11 p. (TIP U9475).
Translation of: Theorie der Schrägsicht. — Zeitschrift für Meteorologie, 1 (6): 161-175. 1947. DLC (QC851.Z4, v. 1)

The meteorological visual range is defined as the distance at which a target of observation lies just at the boundary of visibility. The principal

determining factors are: meteorological conditions, target properties, and physiological properties of the observer's eye. A previous attempt by H. Koschmieder (Beiträge zur Physik der freien Atmosphäre, 12: 33-53, 171-181. 1924) to express visual range by means of a mathematical equation is extended in this study to conditions of inhomogeneous turbidity, and the formula is applied to aerial targets observed from the ground. A method is described by which visual range can be determined graphically.

Foley, J. P. see Anastasi, A., 1952

Folsom, W. W. 1952
RELATIONSHIPS BETWEEN THE NEW OFFICER QUALITY STANINE, AMERICAN COUNCIL ON EDUCATION PSYCHOLOGICAL EXAMINATION, AND VARIABLES FROM THE AIRCREW CLASSIFICATION BATTERY. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. PERS 52-53. Dec. 1952. 3 p. (Project no. 503-001-0012; AD 7951). UNCLASSIFIED

Test scores were correlated by the Pearson product-moment method. The new (1952) Officer Quality Stanine (OQS) correlates substantially (r=0.78) with the American Council on Education psychological examination (ACE), in comparison with a correlation of 0.62 between the old OQS and ACE. The OQS quantitative composite of tests from the Aircrew Classification Battery had a correlation of 0.70 with ACE quantitative scores. The OQS linguistic composite, also composed of battery tests, had a correlation of 0.77 with ACE linguistic scores. The correlation of ACE composites (0.52) was approximately equal to that of OQS composites (0.50). The new OQS gave correlations of 0.22 with the Pilot Stanine, 0.80 with the Navigator Stanine, and 0.62 with the Pilot Training Instructor Stanine, in comparison with values of 0.40, 0.67, and 0.63, respectively, given by the old OQS. (AD abstract)

Fontaine, A. B. see Warren, C. E., 1952a

Forcher-Mayr, O. 1952
[INVESTIGATIONS CONCERNING THE LEUKOCYTE PICTURE AND THE RETICULOCYTES ON HIGH MOUNTAINS] Untersuchungen des weissen Blutbildes und der Retikulozyten im Hochgebirge. — Wiener Zeitschrift für innere Medizin und ihre Grenzgebiete (Wien), 33 (6): 220-223. 1952. In German. DSG

Percentual variations of leukocytes and reticulocytes were determined in the blood of 23 participants of a course in alpine sports (offered by the Institute of Physical Education of the University of Innsbruck) during and after physical training at an altitude of 2,860 m. After acclimatization to the altitude, a slight increase in reticulocytes was observed when the training was stepped up; there was also a slight "shift to the left" (preponderance of young neutrophils), which persisted after return to the plain. Where altitude acclimatization was incomplete, excessive training and accumulated fatigue caused a marked increase in reticulocytes, a decrease of lymphocytes, and again a slight shift to the left. Where training was lacking and altitude acclimatization had not been completed, a conspicuous increase of reticulocytes and a distinct shift to the left, but no incidence of leukocytosis were observed.

Forgays, D. G. see Knoell, D., 1952

Fortier, G. 1952
and L. Dugal
[ACTION OF THIAMINE HYDROCHLORIDE ON THE TOXIC EFFECTS OF ALCOHOL IN THE MONKEY EXPOSED TO SIMULATED ALTITUDES] Action du chlorure de thiamine sur les effets toxique de l'alcool chez le singe exposé aux altitudes simulées. — Médecine aéronautique (Paris), 7 (1): 33-37. 1952. In French. DLC (TL555.M394, v. 7)

The effects of intoxication at simulated altitude of 15,000 and 35,000 ft. were studied in rhesus monkeys [Macaca mulatta]. A total of 50-75 cc. of 40% alcohol, with or without vitamin B_1 (thiamine) added, was administered 16 and 15 hours before ascent. All monkeys which had received alcohol alone became sick between 15,000 and 30,000 ft. of altitude; monkeys which had received vitamin B_1 with the alcohol remained well up to 30,000 ft. unless the maximum dose of alcohol had been given. The author concludes that vitamin B_1 counteracts the toxic effects of alcohol under conditions of anoxia.

Fowler, E. P. see Lindenberg, P., 1952

Fox, M. S. 1952
INDUSTRIAL NOISE: ITS MEDICAL, ECONOMIC, AND SOCIAL ASPECTS. — Amer. Jour. Med. Sci., 223 (4): 447-460. 1952. DSG

Studies on industrial noises, including airplane noises, are reviewed. The physiological and traumatic effects of noise are discussed, as related to the following main factors: intensity level, frequency, individual susceptibility, age, co-existent ear diseases, character of surroundings, distance from source, and position of the ear in relation to the sound waves. The characteristics of hearing loss and structural changes in the auditory apparatus are briefly described. Intensity levels of various sounds (in decibels) are tabulated. The noise from air-jets is among the most injurious.

Franck, C. see Grandpierre, R., 1952, 1952b, 1952c, 1952d, 1952e, 1952h, 1952i, 1952j
Franke, E. K. see Gierke, H. E. von, 1952

Frankl, V. E. 1952
and O. Pötzl
[ON MENTAL CONDITIONS DURING FREE FALL: A PSYCHOPHYSIOLOGICAL STUDY] Über die seelischen Zustände während des Ab-

sturzes; eine psychophysiologische Studie. — Monatschrift für Psychiatrie und Neurologie (Basel), 123 (6): 362-374. 1952. In German.
DSG

Psychological and pathophysiological aspects of free falling are illustrated by two examples (a worker falling from a scaffold and a mountain climber). These experiences manifest themselves as a continuous sequence of memory images arranged in order of their happening, from the earliest childhood up to the present.

Frantz, M. E. see Chinn, H. I., 1952e
Franzblau, S. A. see Marbarger, J. P., 1952

Fraser, D. C. 1952
A STUDY OF FATIGUE IN AIRCREW. I. VALIDATION OF TECHNIQUES. — Medical Research Council (Gt. Brit.). Applied Psychology Research Unit, Cambridge. Interim Report A.P.U. no. 185/52, Dec. 1952. 9 p. (AD 12 160).
UNCLASSIFIED

Deterioration in navigator performance of vigilance tasks was studied by a laboratory timing test requiring the operator to estimate the time at which a moving object reached the center of a screen. The significant stimuli were interspersed randomly in a long series of neutral stimuli. The performances were measured by the variance of the operator's estimates from his mean estimate. Variance scores for navigators when fresh ranged from 0.28 to 4.41 and were markedly superior to the scores of naval personnel (0.5 to 19.2). A rise in variance occurred in 23 of the 36 cases during the second half hour of the task, but reversals were noted for subjects with poor over-all performance and for a majority of subjects after flying. Scores showed a significant deterioration effect after long sorties; evidence of a rise after a short sortie was not indicated. Performances of 6 good operators after flying when tested under stress conditions showed a greater deterioration than under nonstress conditions. The fatigue effect appeared to outweigh the effect of the time of day at which the test was given. Commanding officer ratings of the navigators were obtained in an effort to explain the marked individual differences in performance. (AD abstract, modified)

F[rederick], W. R. 1952
AMPHETAMINES AND FLYING. — Med. Technicians Bull., 3 (5): 228. 1952.
DLC (RC970.U72, v. 3)

A note to the effect that aircrew members should abstain from flying while under the influence of amphetamine or related drugs (Benzedrine, Dexedrine, etc.). Faulty reactions, due to the drugs, in situations under stress may have fatal consequences.

Frese, F. J. see Sells, S. B., 1952
Friedman, G. see Abt, J. C., 1952; Madden, H. L., 1952; Zachert, V., 1952a, 1952e

Fry, G. A. 1952
PSYCHOLOGICAL FACTORS IN VISUAL ACUITY. — Amer. Jour. Optometry, 29 (12): 624-630. 1952.
DSG

The following psychological factors related to visual acuity are distinguished: (1) interpretation of blurred images; (2) change in sharpness of the optical image on the retina, produced by changes in accomodation and pupil size as a result of an effort to see; and (3) the effect of a change in interocular pressure on the brightness difference threshold when an effort is made to see. The behavioral mechanism of the "effort to see" and its interrelationship with organic optical functions are discussed.

Frye, S. A. see Burch, B. H., 1952

Fryers, G. R. 1952
EFFECT OF DECREASED ATMOSPHERIC PRESSURE ON BLOOD VOLUME OF RATS. — Amer. Jour. Physiol., 171 (2): 459-464. 1952.
DLC (QP1.A5, v. 171)

Eight groups of rats were exposed to a simulated altitude of 15,000 feet for from 3 to 100 days. One group was maintained at 15,000 feet for 35 days and then raised to 20,000 feet for an additional 13 days. The total red cell volume showed a pronounced increase during the initial time of exposure, while the plasma volume decreased at an equal rate. Hemoglobin values per 100 gram increased steadily with increasing altitude, but leveled off at about 20,000 feet.

Fryers, G. R. 1952a
and N. I. Berlin
MEAN RED CELL LIFE OF RATS EXPOSED TO REDUCED BAROMETRIC PRESSURE. — Amer. Jour. Physiol., 171 (2): 465-470. 1952.
DLC (QP1.A5, v. 171)

The life span of red blood cells of the rat was studied by tagging the cells with radioactive carbon (glycine-2-C^{14}). In control rats kept at sea level this life span was 60 days; in animals acclimatized to and maintained at altitude (15,000 feet, decompression chamber), the average cell life was 63 days; when the blood cells of altitude-acclimatized rats were tagged and the rats returned to sea level, 64 days; cells tagged during the initial erythrocyte response to altitude, approximately 50 days; and cells tagged 7 days before decompression, 56 days. The evidence does not support the concept that the returning of altitude-acclimatized animals to sea level results in an increased destruction of red blood cells.

Frykholm, A. 1952
[REACTION TIME AND REACTION ABILITY IN HIGH SPEED FLIGHT] Reaktionstid och reaktionsförmåga vid flygning med höga hastigheter. — Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 1952 (2): 4-8. 1952. In Swedish.
DSG

The reaction time of a pilot in relation to the speed of the plane is discussed and represented graphically for the hypothetical case of a plane flying at Mach 3. At this speed the process of motor reaction can be divided into the following successive phases: (1) the latent period (0.1 second) during which the plane would progress 100 m.; (2) the time required for eye adjustment or turning of the head, e.g. toward a suddenly discovered plane (0.1 second), during which the plane would progress an additional 100 m.; (3) time required for mental association of the sensory impression (0.05 second), during which the plane would progress 50 m.; and (4) time required for motor-reaction to take effect (0.2 second), which would correspond to a distance of 200 m. The following recommendations are made: a conscious effort should be made on the part of the pilot to avoid movements of the head or eyes as much as possible, and instrument layout should be designed accordingly; aviation cadets should be taught the above facts, and "quick seeing" should be practiced; only individuals with short reaction and visual adjustment times should qualify to pilot high-speed planes (the fact that reaction time increases with increasing age should be borne in mind); the avoidance of alcohol, of vitamin-deficient food, of overtiredness and of lack of oxygen should be mandatory, because of their retarding effects on visual adjustment.

Frykholm, A. 1952a
[EMOTIONAL REACTIONS OF FLYERS TO FLIGHT DUTY] Flygarens emotionella reaktionssätt inför flygtjänsten. — Meddelanden från flyg- och navalmedicinska nämnden, 1952 (3): 10-17; discussion p. 17-19. 1952. In Swedish. DSG

An analysis of the motivations of, and psychological reactions to, flying is presented, based chiefly on observations of flyers and aviation candidates of the Swedish air force. In the development of a pilot throughout the years of flying, the following progressive stages may be distinguished: (1) the newly-fledged pilot who has not encountered any mishaps, thoroughly enjoys flying — adverse factors (family obligations, financial worries) do not make themselves felt yet; (2) between the second and fourth year of flying, the pilot becomes more conservative and careful in his attitudes and habits, he gains in self-confidence and is able to assess his own limitations and the extent of risks incurred; (3) between the ages of 25 and 37 years, the pilot, who is assumed to have had his first encounters with crashes and to have suffered losses of close friends, has reached his peak of effectiveness; (4) after the age of 37, the pilot, while judicious and reliable in his performance, begins to lack enthusiasm and becomes distrustful of technical innovations. The author attempts to develop a simple classification of the progressive stages of psychic trauma in pilots, and to indicate ways of predicting their predisposition. Various specific psychological problems related to pilots are brought out in the discussion following the presentation of the paper.

Galiana, T. de 1952
[NEW TECHNIQUES OF PARACHUTING] Techniques nouvelles de parachutage. — Atomes (Paris), v. 7 (79): 333-337. 1952. In French.
DLC (Q2.A78, v. 1952)

This is an illustrated summary of the functioning of the ejection seat and the physiological effects of high-altitude bailout. The outlooks of recently developed techniques, such as the ejection capsule, are briefly discussed.

Gallagher, J. B. 1952
and J. E. Goodwin
TEMPORARY CHANGES IN ACUITY OF THE EAR FOLLOWING EXPOSURE TO INTENSE NOISE. — A.M.A. Arch. Indus. Hyg. and Occup. Med., 6 (4): 332-338. 1952.
DLC (RC963.A14, v. 6)

The effects of 10-minute monaural exposure to wide-spectrum ("white") noise was tested on a group of 47 subjects with normal hearing acuity and on a group of 16 subjects with contralateral high-tone deficiencies. Subsequent hearing losses were measured (in decibels) at frequencies of 2048, 4096, and 8192 cycles per second (cps). In all cases the initial post-exposure loss was least severe at the low frequency (2048 cps), and recovery was complete within 30 minutes, the time of recovery being proportional to the severity of the hearing loss. In evaluating the test results, the following groups were distinguished: (1) a hyposusceptible group comprising subjects with normal binaural hearing acuity, whose ears were relatively resistant to high-level noise of 4096 cps; (2) a hypersusceptible group, comprising those with normal binaural acuity, who exhibited much greater susceptibility to noise at 4096 cps; (3) the contralaterally deaf group of 16 subjects with slight high-tone deficits in one ear only, whose normal ears showed poor resistance at 4096 cps to noise exposure and whose responses resembled those of Group (2). All subjects of Group (3) reported previous exposure to high-level noise, either in industry or in warfare. Among the subjects with normal binaural hearing, approximately one-third of those in Group (1) had previously experienced a comparable severe exposure (without apparent effect), whereas none of Group (2) had been exposed previously to excessive noises.

Gallagher, R. T. see Schafer, G. E., 1952
Gambacorti Passerini, P. see Crema, A., 1952
Gammon, W. R. see Chinn, H. I., 1952e

Ganguly, K. K. 1952
ASPECTS OF RECREATIONAL TRAINING IN THE I. A. F. — Indian Air Force Quart. (New Delhi), 2 (2): 91-96. 1952.
(DLC (UG635.I4I5, v. 2)

The author expresses his concern about the fact that in the training program of the Indian Air Force, sports form merely a "part of an overall welfare activity" rather than a vital training factor. The importance of recreational training

with regard to physical and mental conditioning and morale building is stressed.

Gannon, W. J. see Gierke, H. E. von, 1952a

Gaspa, P. H. 1952
[CHANGES IN THE HEPATIC GLYCOGEN LEVEL AT SIMULATED ALTITUDE] Variation du taux du glycogène hépatique en altitude fictive. — Médecine aéronautique (Paris), 7 (4): 471-475. 1952. In French. DLC (TL555. M394, v. 7)

Literature data on the changes in the glycogen content of the liver in animals exposed to simulated altitudes are contradictory: some authors have reported increases, others decreases of the glycogen level. — The author made exact measurements of the glycogen content of the liver tissue of guinea pigs both exposed to altitude and unexposed controls. The glycogen level was found to be augmented in the decompressed animals. It is concluded that both the increased liver glycogen and the simultaneous hyperglycemia may be caused by a diminution of organic oxidations at low ambient pressure.

Gaspa, P. [H.] 1952a
[COSMIC RAYS AND THEIR BIOLOGICAL EFFECTS ON THE AVIATOR] Les rayons cosmiques et leurs effets biologiques sur l'aviateur. — Médecine aéronautique (Paris), 7 (2): 187-194. 1952. In French.
DLC (TL555. M394, v. 7)

Millikan measured the ionization produced by cosmic radiation, from sea level up to 30,000 m. At sea level, the radiation amounted to 0.1 milliroentgen equivalent physical (mr.e.p.) per 24 hours; it increased with higher altitude until it reached the value of 15 mr.e.p. at about 23,000 m. Above this altitude, due to the presence of charged heavy nuclei, the biological effects may be expected to be similar to those of alpha rays, but with 1000 times greater penetration into the living tissue and 10 to 600 times stronger ionization effects. The biological effects of this radiation would be similar to those of radium (also an alpha emitter): 1 microgram of radium induces great damage in the bone marrow and the pulmonary tissue, and finally death. At present, aviation activities do not exceed the altitude of 23,000 m.; if the exposure of the pilot is not too extended at this level, no harmful biological changes may be expected. Long exposures, however, could induce genetic (effects on germ cells) and somatic (destruction of the hemopoietic organs) injuries.

Gass, H. see Cassen, B., 1952
Gates, D. see Beck, G. J., 1952

Gatland, K. W. 1952
DESIGN FOR ZERO "G": A MAN-CARRYING ROCKET FOR PHYSIOLOGICAL RESEARCH IN NEAR SPACE. — Flight (London), 61: 774-775, 779. June 27, 1952. DLC (TL501. F5, v. 61)

The plans for a man-carrying rocket presented by R. A. Smith and H. E. Ross of Great Britain in 1946 are discussed. The rocket, which would be propelled by compressed air and alcohol, would have no tail fins. Its initial trust would be 60,000 lb, its initial acceleration 9.8 ft/sec^2 (after 110 seconds, the effective acceleration would be 2 g.). An automatic device would keep the rocket under control in case the pilot would black out. The essential feature of the missile would be its detachable cabin unit, jettisoned by an automatic compressed-air device shortly before peak altitude would be reached. The cabin would descend by parachute. While outside the effect of the gravitational pull of the earth, various degrees of "weight" of the pilot may be attained by an axial spin imparted on the cabin by small peroxide-permanganate motors firing tangentially at right angles to its main axis. The range of the rocket has been calculated to be 200 miles, but 180-190 miles is considered the limit of safety.

Gaul, L. E. 1952
and G. B. Underwood
RELATION OF DEW POINT AND BAROMETRIC PRESSURE TO CHAPPING OF NORMAL SKIN. —Jour. Investigative Dermatol., 19 (1): 9-19. 1952. DLC (RL1. J. 82, v. 19)

Meteorological data obtained from the nearest weather bureau over a period of one year were plotted against dermatological observations made on 8 persons, with particular regard to chapping of their skin. Each period of chapping could be correlated to a sudden change from high to low air moisture (expressed in dew point) and to a sudden rise in barometric pressure. It may be assumed that low dew points produce a marked desiccation of the horny mantel of the skin, a condition which is enhanced by the change in air pressure affecting the equilibrium between dermis and epidermis. Other factors which accentuate chapping are wind, water (from unsufficiently dried skin after washing), and soap. The symptoms, incidence, distribution, and prophylaxis of chapping are discussed.

Gee, A. H., 1952
M. R. Stevens, and F. De Angelis
ODOR CONTROL FOR AIR EVACUATION AIRCRAFT. — Sept. 1952. 8+78 p. Foster D. Snell, Inc., New York (Contract AF 18(600)-146); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. AF Technical report no. 6565, part 4 (Project no. 52-660A-1) (AD 9726).
PB 111316

This is the fourth formal report on work intended to find ways to suppress malodors from wounds of patients on air evacuation aircraft, without interfering with detection of alarm odors indicative of mechanical trouble or overheating. In this phase of the investigation, malodor, odor control agent, and alarm odor were commingled in a dynamic air flow system equipped with sniff ports for appraising the resulting mixtures. — Ozone was found to have a definite cancelling ef-

fect, selective for malodor, and not interfering appreciably with the alarm odors. The amounts needed, however, present a problem in practical application from the standpoint of tolerable levels of ozone. — One aldehyde, 3,5,5-trimethyl hexalydehyde, was investigated extensively, as an example of a volatile organic compound of the masking type. It was found to suppress malodor, but only when used in large amounts. These amounts, from toxicological studies, may have an unfavorable effect on personnel. (Authors' abstract)

Gee, A. H., 1952a
P. D. Ellner, and M. R. Stevens
CONTROL OF ODOR IN EVACUATION AIRCRAFT. — May 1952. vii+40 p. Foster D. Snell, Inc., New York (Contract AF 18(600)-146); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. AF Technical report no. 6565, part 3. DSG
PB 111317

This is a continuation and extension of work intended to find methods or materials for surpressing malodors on evacuation aircraft, without interfering with the detection of alarm odors indicative of mechanical trouble or overheating. Two kinds of agents have been found more promising than any hitherto investigated for this purpose. Ozone from small generators has been found capable of reducing high levels of malodor, which can be virtually eliminated under laboratory conditions. The action of ozone is selective so that alarm odors can still be detected, save under extreme conditions. The results are considered sufficiently promising to warrant investigation of the problem of practical application. Two aldehydes have been found useful for odor control, both of them superior to heptaldehyde. Heptaldehyde was one of the more promising of a series of essential oils, aldehydes, and related materials previously investigated. One of the aldehydes, 3, 5, 5 trimethyl hexanal, is believed worth further investigation. (Authors' abstract)

Gell, C. F. 1952
and D. Cranmore
A STUDY OF FLUID SHIFTS IN SMALL RODENTS EXPOSED TO ACCELERATIVE STRESS. — Naval Air Development Center. Aviation Medical Acceleration Lab., Johnsville, Pa. Report no. NADC-MA-5201, April 7, 1952. viii+50 p. (Project report no. NM 001 060.05.01; TIP U21961). UNCLASSIFIED

An apparatus was designed and constructed that made possible the actual fixation of anatomical and physiological changes of the rat under centrifugation stress. Studies were carried out on 60 rats (200 to 300 g.). Freezing to a completely solid state by immersion in liquid nitrogen was accomplished in approximately 150 sec. Static conditions for circulation and respiration were, however, imposed much faster, in about 15 sec. or less. The quick-freezing technique in itself did not cause any apparent fluid shifts in the tissues of the rat. There was no demonstrable exchange of fluid from completely frozen to partially frozen tissues. Anatomical changes such as organ displacement and edema were fixed under actual centrifugation stress in a striking and incontrovertible frozen picture. (TIP abstract)

Gerathewohl, S. J. 1952
PHYSICS AND PSYCHOPHYSICS OF WEIGHTLESSNESS: VISUAL PERCEPTION. — Jour. Aviation Med., 23 (4): 373-395.
DLC (TL555.A1A4, v. 23)

This is a review of the various factors involved in the visual perception of space and an attempt to analyze the conditions of spatial orientation as they would obtain in the state of subgravity and zero gravity. The circulation of the blood would probably adjust easily to zero gravity, as it does to abnormal postures of the body. Spatial orientation normally relies on two sets of clues, visual and gravitational. Behavior in case of conflicting clues (e.g., the visual and gravitational conflict during various accelerations in flight or on the centrifuge) is discussed in some detail. Nystagmus and visual illusions (oculogravic and oculogyral effects) further interfere with man's control of his environment. The possible hazards of the transition from the gravity state to the gravity-free state are pointed out. A bibliography of 69 references is appended.

Gerathewohl, S. J. 1952a
EYE MOVEMENTS DURING RADAR OPERATION. — Jour. Aviation Med., 23 (6): 597-607. 1952.
DLC (TL555.A1A4, v. 23)

Eye movements recorded during radar operation (PPI scope) proved to be more complex than under normal operational conditions. The eyes follow the sweep in jerks; the duration of the eye movement is 16-35 milliseconds, that of fixation 428-1816 milliseconds, depending upon the task (orientation, navigation, bombing). The eye movements are linear (horizontal, vertical, diagonal) or circular. It is believed that straining the eyes at continuous radar observation over a long period of time may cause fatigue and drowsiness.

Gerathewohl, S. J. 1952b
CONSPICUITY OF FLASHING AND STEADY LIGHT SIGNALS. II. HIGH CONTRASTS. — School of Aviation Medicine, Randolph Field, Tex. Feb. 1952. iii+8 p. (Project no. 21-24-014, Report no. 2; TIP U21306).
UNCLASSIFIED

The conspicuity of steady and flashing light signals was studied at contrast ratios of 1031.6, 138.9, 19.0, 18.3, and 6.6 after previous investigations had found flashing light signals more conspicuous than steady light stimuli at contrast ratios of 1.00 and lower. This study indicated that the effect of the two kinds of light was reversed when higher contrasts were used. In Test Series I, the response time to steady light signals was

found to be shorter than the response time for flashing signals on all contrast levels; in Test Series II the response time for steady light was slightly shorter for the contrast ratios of 19.0, 18.3, and 6.6. With the two highest contrasts, no significant differences appeared. (School of Aviation Medicine abstract)

Gerathewohl, S. J. 1952c
and D. Rubinstein
INVESTIGATION OF PERCEPTUAL FACTORS INVOLVED IN THE INTERPRETATION OF PPI-SCOPE PRESENTATION. II. A PILOT STUDY ON FORM DISCRIMINATION. — School of Aviation Medicine, Randolph Field, Tex. Aug. 1952. 3+12 p. (Project no. 21-24-009, Report no. 2; TIP U24134). PB 107462

Experiments on the relative discriminability of twelve targets of simple planimetric form were performed, using a supersonic trainer and radar equipment as research devices. The six basic forms used in the experiment were pairs of circles, triangles, rectangles, squares, trapezoids, and ellipses, which were presented on the radar scope at three different distances from the antenna. The targets were identified by 24 untrained observers with the rotating antenna in the center of the target circle. The following results were obtained: (1) Significant differences in discriminability of the twelve targets were found, and both position and geometric shape seem to contribute to these differences. The rank on the basis of discriminability conforms to some extent with that found in other studies on form discrimination. (2) A target was more easily recognized as its size was increased. (3) Significant differences in ability to identify the targets were found among individuals. (Authors' summary)

Gerstner, H. B., 1952
C. P. Powell, and E. O. Richey
THE BIOLOGICAL AND MEDICAL ASPECTS OF IONIZING RADIATION. III. THE IMMEDIATE EFFECT OF X-RADIATION ON THE ISOLATED STRIATED FROG MUSCLE. — School of Aviation Medicine, Randolph Field, Tex. Oct. 1952. iii+8 p. (Project no. 21-47-005, Report no. 3; AD 1103). PB 108391

The gastrocnemii of 120 frogs were isolated in pairs. One of each pair was exposed for various time periods to a dose rate of 6,000 r/min. of x-radiation. A low dose range (0 to 30,000 r) caused no significant immediate deviation from normal. A medium range (30,000 to 150,000 r) compromised muscle function and caused gross morphological changes in coloration, translucency and length. Doses greater than 150,000 r produced an immediate abolishment of muscle function and more pronounced morphological changes. (AD abstract)

Gibson, E. J. 1952
and Joann Smith
THE EFFECT OF TRAINING IN DISTANCE ESTIMATION ON THE JUDGMENT OF SIZE-AT-A-DISTANCE. — Dec. 1952. vi+19 p. Cornell University, Ithaca, N. Y. (Contract no. AF 33(038)-22373); issued by Air Training Command. Human Resources Research Center. Perceptual and Motor Skills Research Lab., Lackland Air Force Base, Tex. Research bulletin no. 52-39 (Project no. 509-019-0002) (AD 6215). PB 109068

A comparison was made of subjects with distance-estimation training and subjects without training in respect to their ability to estimate size-at-a-distance. Twenty photographs of four objects at each of five distances were used. No significant transfer occurred between the two functions as measured by average or constant error. This may have resulted from the high accuracy of size judgments possible without training, or because the association of a specific word with a specific identifying clue, which probably accounted for the improvement in distance estimation, may not produce a generalized improvement. Some indication of transfer was suggested with respect to variability of size judgments. The speed of learning distance estimation was positively related to the accuracy of size judgment. (AD abstract)

Gibson, J. J. 1952
THE RELATION BETWEEN VISUAL AND POSTURAL DETERMINANTS OF THE PHENOMENAL VERTICAL. — Psychol. Rev., 59 (5): 370-375. 1952. DLC (BF1. P7, v. 59)

Under normal conditions in spatial orientation, gravitational (proprioceptive) and visual stimulations supplement each other ("co-varying clues"). In situations where the orientational system of references deviates from the gravitational vertical (as might be the case in airplane flight), situation of "contradicting clues" may arise and the process of spatial orientation becomes ambiguous. While it has been shown experimentally that the modes of orientation (choice of clues) in such situations vary with the individual, the basic mechanisms by which space is perceived appear to be identical. The various theories underlying the problem of space perception are critically reviewed.

Gibson, J. J. 1952a
and J. Cornsweet
THE PERCEIVED SLANT OF VISUAL SURFACES — OPTICAL AND GEOGRAPHICAL. Jour. Exper. Psychol., 44 (1): 11-15. 1952. DSG

Two types of slant are distinguished on the basis of experimental evidence: (1) the so-called "optical slant" which depends on the geometrical relation of an observed surface to the eye (and not on its relation to other parts of the surroundings or to gravity) and corresponds to the direction of increasing texture density in the retinal image; and (2) the "geographical slant" which is independent of the foveal texture density gradient. A hypothesis is advanced to the effect that the posturalkinesthetic stimulation which goes with the turning of the head and eye is correlated with the reti-

nal stimulation (which yields optical slant) and that the two jointly determine geographical slant. Due to a "compensatory relation" between the angular rotation of the eye and the angular optical stant, the perception of geographical slant remains constant. This explains why one perceives a level surface as such, when lifting the eyes from the feet up to the distant horizon.

Gierke, H. E. von, 1952
H. L. Oestreicher, E. K. Franke,
H. O. Parrack, and W. W. von Wittern
PHYSICS OF VIBRATIONS IN LIVING TISSUES. — Jour. Applied Physiol., 4 (12): 886-900. 1952. DSG (W1 J0544, v. 4)

Determinations of body reactions to vibration were carried out on humans in the frequency ranges from 0 to 20 kilocycles per second. Different frequencies were shown to produce different distribution patterns of vibratory energy inside the body. In an effort to reach a quantitative evaluation of vibratory effects, the authors demonstrated that the simplified model of a vibrating sphere in an elastic viscous compressible medium approximates the mechanical behaviour of body tissue to which a vibrating force is applied perpendicularly. Shear elasticity values and viscosity coefficients of the body tissues were determined, and from these constants the mechanical behavior of the body surface was calculated for the frequency range from 0 to 105 cps.

Gierke, H. E. von, 1952a
H. O. Parrack, W. J. Gannon, and
R. G. Hansen
THE NOISE FIELD OF A TURBO-JET ENGINE. — Jour. Acoust. Soc. Amer., 24 (2): 169-174. 1952. DLC (QC221.A4, v. 24)

Noise measurements were carried out on turbojet engines at various distances and power settings. Over-all sound pressure directivity patterns of the turbojet engine noise and directional characteristics for different octave bands were recorded graphically. Sound levels are 6 decibels higher at 25 feet than at 50 feet. With the engine idling, most of the sound is radiated toward the front end of the engine, while for higher engine power settings the sound is radiated in the direction of the gas jet with maxima of 138 db. and 142 db., at 7200 r.p.m. and 7850 r.p.m., respectively. For frequencies above 100 c.p.s the sound levels decrease and the directivity pattern broadens, more sound being radiated perpendicularly to the gas stream. The noise of the idling engine is most intense around 3500 c.p.s. and originates in the compressor of the engine.

Gierke, H. E. von, 1952b
H. O. Parrack, and D. H. Eldredge
HEATING OF ANIMALS BY ABSORBED SOUND ENERGY. — Jour. Cellular and Compar. Physiol., 39 (3): 487-505. 1952.
DLC (QP1. W533, v. 39)

This is the same as the report, Gierke, H. E. v., 1950.

The sound absorption of anesthetized rats with normal fur or with the fur shorn, and of the furred rat skin removed from the body was studied. Sound fields above 150 decibels and frequencies up to 6000 c. p. s. were employed. On the intact fur, the sound absorption coefficient decreased up to 1500 c. p. s. where it reached a minimum of 3%; above 1500 c. p. s. the coefficient increased again, being about 12% at 6000 c. p. s. On the bare skin, the absorption coefficient decreased with increasing frequency, and on the isolated furry skin it increased with increasing frequency throughout the range tested. — The behavior below 1500 c. p. s. depends mostly on the properties of underlying tissue, while above 1500 c. p. s. it is dependent on the physical properties of the fur. This coefficient permits the calculation of sound vibration absorbed by the whole animal. The duration of survival of the animal in a sound field is related to its heat balance.

Gilinsky, A. S. 1952
A REVIEW OF LITERATURE ON THE RELATIVE EFFICIENCY OF THE DOMINANT AND THE NON-DOMINANT EYE. — Jan. 1952. iv+19 p. Columbia Univ., New York (Contract AF 33(038)-22616); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-13 (RDO no. 694-45) (AD 3567). PB 109178

Studies relating eye dominance (as determined by sighting tests) to tasks of eye-hand coordination suggest that the combination of eye dominance and hand dominance is a considerably more important factor than eye dominance alone. Agreement between handedness and eyedness has been shown to lead to greater efficiency in pursuit and fixed target tests. Results showed no advantage for the dominant eye as compared with the non-dominant eye except in cases of unmixed laterality and in not all of these cases. — In general, eye dominance as determined by a variety of tests, has not been found to be significantly related to visual acuity. — In a variety of tasks requiring shooting or aiming at a target, the use of both eyes together has been recommended as superior to the exclusive use of either the dominant or the non-dominant eye. — No significant differences in the behavior of the dominant and the non-dominant eye are indicated for eye movements, flicker frequency, diplopia thresholds, range of apprehension, or reading achievement. Evidence on the stability of eye dominance is inconclusive. (From the author's summary) (52 references)

Gilinsky, A. S. see also Diamond, A. L., 1952
Gillespie, K. W. see Vail, E. G., 1952a

Girling, F. 1952
and C. Maheux
PERIPHERAL CIRCULATION AND SIMULATED ALTITUDE. — Jour. Aviation Med., 23 (3): 216-217, 270. 1952. DLC (TL555. A1A4, v. 23)

Rabbits were taken to an altitude of 30,000 feet in a decompression chamber without added

oxygen. Blood pressure, critical closing pressure, flow, and flow resistance of the femoral artery were measured at 10,000, 20,000, 30,000 feet during both ascent and descent. No significant changes of the blood pressure were noted but there was a considerable (100%) increase in resistance to flow. In the second series of tests, the animals were decompressed while breathing 100% oxygen. At an altitude of 40,000 feet they showed no signs of anoxia (but abdominal distention became apparent above 35,000 feet). There was an increased resistance to blood flow at altitude. This was not due to anoxia, as an increased resistance was apparent whether the animals were breathing 100% oxygen or not.

Glaser, E. M. 1952
and G. R. Hervey
FURTHER EXPERIMENTS ON THE PREVENTION OF MOTION SICKNESS. — Lancet (London), 1952, vol. 1 (10): 490-492. Mar. 8, 1952.
DLC (R31.L3, 1952, v. 1)

Two groups of a total of 150 soldiers were placed on a rubber raft, exposed to artificial waves (6 days, for one hour every 48 hours) in a large swimming pool, and given a number of drugs as well as inactive substances for comparison. It was shown that hyoscine hydrobromide (1 mg.), or hyoscine hydrobromide (0.6 mg.) mixed with promethazine 15 (mg.), were more effective in preventing symptoms of seasickness than promethazine hydrochloride ("Phenergan") (35 mg.). The effects of hyoscine (1 mg.), and of hyoscine (1 mg.) with promethazine (15 mg.) were almost alike (11% of the men were affected by seasickness in both instances). Psychological factors (e.g., the sight of others being sick) were found to play some part in the incidence of nausea and vomiting. There was a certain degree of adaptation in most men during the first five days but a slight relapse on the sixth day. Hyoscine (1 mg.) was found most effective when given 1 1/4 hour before exposure.

Glendinning, W. G. see Bedwell, M. E., 1952, 1952a
Gleser, G. C. see DuBois, P. H., 1952; Ulett, G. A., 1952

Glorig, A. 1952
FIELD INVESTIGATION ON MILITARY PERSONNEL AS REGARDS SOUND. — In: Noise—causes, effects, measurement, costs, control, p. 99-106. Ann Arbor, Mich.: Univ. of Mich. Press, 1952. DLC (RA772.N7M5)

From a military standpoint, the problem of noise manifests itself in four ways: (1) effect on communication, (2) acoustic trauma (degeneration of the organ of Corti); (3) blast trauma (injury of the organ of Corti and of the middle ear); and (4) psychological effects, prevailing mostly until adaptation occurs. The intensity of military noise varies between 90 and 180 decibels; the highest levels are usually instantaneous, the lower ones, 110 to 140 decibels, may last for a longer period of time. Of particular interest is noise associated with jet engines which often exceeds 140 db. and includes frequencies which overlap the frequencies of speech (500-3500 c.p.s.). — With regard to protection of military personnel against excessive noise, the following aspects are to be considered: the noise intensity, the minimum exposure time inducing injury, individual susceptibility, and the amount of protection needed. Intensities of 130 db. or above induce acoustic damage in a short time; exposure to 100-120 db. may in time lead to hearing loss; in susceptible subjects, even 90-100 db. will produce damage. No injury is experienced below 90 db. The necessity of using better fitting ear plugs is emphasized.

Golan, D. L. see Wilcoxon, H. C., 1952

Goldman, D. E. 1952
MECHANICAL VIBRATION AND ITS EFFECTS ON MAN. — Naval Medical Research Inst., Bethesda, Md. Lecture and review series no. 52-1, Feb. 6, 1952. 7+3 p. (AD 6179).
UNCLASSIFIED

Reprint of a lecture delivered as part of the Training Course for Public Health Officials on "The Acoustic Spectrum" given by the School of Public Health, University of Michigan, February 5-8, 1952. A general discussion is given of low-frequency mechanical vibration in the range from one to a few hundred cycles per second with special reference to its effects on man. Matters taken up include the relevant physical properties of tissue, vibration [perception] thresholds of persons seated or standing on vibrating supports, subjective responses, physiological and pathological effects. Applications to industry and transportation are suggested and the need for further experimental work is emphasized. (Author's abstract)

Goldman, D. E. 1952a
MECHANICAL VIBRATION AND ITS EFFECTS ON MAN. — In: Noise—causes, effects, measurement, costs, control, p. 54-58. Ann Arbor, Mich.: Univ. of Mich. Press, 1952.
DLC (RA772.N7M5)

Same as the paper, Goldman, D. E., 1952.

Gollwitzer-Meier, K. 1952
and E. Dunker
[THE EFFECT OF OXYGEN DEFICIENCY ON THE REACTION PHASES AND THE BLOOD FLOW OF THE ACTING MUSCLE IN A WARM-BLOODED ANIMAL] Einfluss des Sauerstoffmangels auf die Reaktionsänderungen und auf die Durchblutung des arbeitenden Warmblütermuskels. — Pflügers Archiv für die gesamte Physiologie, 256 (4): 288-295. 1952. In German.
DLC (QP1.A63, v. 256)

Anesthetized dogs with their gastrocnemius exposed in situ were placed in an atmosphere containing 6-7% oxygen in nitrogen for a total of 18 minutes. The muscle was kept at rest during the

first 10 minutes of the experiment, then was stimulated to contract rhythmically. During the phase of muscular action there was an increase in blood flow; no change in oxygen consumption, as compared to normal atmospheric conditions, was observed. The three-phase pattern normally observed in the venous blood of the acting muscle (initial acidity—alkalinity—terminal acidity) was changed in the following manner: hyperpnoic alkalinity prevailed in the first phase and the final acid phase was delayed, reaching its maximum value only after restoration of normal atmospheric conditions. Oxygen consumption was increased during the rest phase of the muscle.

Gomez, A. see Tabusse, L., 1952
Goodwin, J. E. see Gallagher, J. B., 1952

[Gordon, B. L.] 1952
DR. GORDON AT PAN-AMERICAN MEETINGS. — Viewpoint (The Woman's Medical College of Pennsylvania) 7 (5): 1. 1952. DSG

In a paper read at Rio de Janeiro before the International Congress on Diseases of the Chest, the author advanced the following suggestions: (1) heart and chest patients should fly only with medical approval; (2) overeating and alcohol should be avoided before flight time; (3) people suffering from sinusitis should abstain from flying; (4) belts and girdles should be kept tight, because they provide additional support to the abdomen; and (5) chain smoking should be avoided.

Gordon, J. N., 1952
I. R. Sternlicht, and O. M. Weaver
PERSONALITY CHANGES FOLLOWING CARDIAC ARREST. — U. S. Armed Forces Med. Jour., 3 (10): 1469-1473. 1952. DLC (RC970.U7, v. 3)

Sensory functions and psychological reactions were determined in a subject who had suffered severe brain damage due to anoxia following 10 minutes of cardiac arrest. Initial symptoms of stupor, visual and tactile agnosia, graphomotor aphasia, motor ataxia, and poor performance rating in the Wechsler-Bellevue and Rorschach tests improved only partially and very slowly.

Gordon, M. A. 1952
and R. C. Halliday
FACTOR ANALYSIS OF THE PART SCORES OF DIAL AND TABLE READING BP622-621A, BIOGRAPHICAL INVENTORY BE601B INSTRUCTOR KEY, EDUCATION, AND SELECTED TESTS FROM THE 1949 NORMATIVE SURVEY. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research Note no. PERS 52-47, Dec. 1952. 15 p. (Project no. 503-001-0001; AD 8133). UNCLASSIFIED

A factor analysis of an intercorrelation matrix consisting of the three part scores of Dial and Table Reading BP622-621A, Biographical Inventory-Instructor BE601B, education in years, and 19 selected tests from the 1949 Normative Survey was carried out to determine factorial differences among the part scores.

The three parts of Dial and Table Reading have very similar loadings on all factors except the Table Reading doublet. There is very slight evidence to support the hypothesis that Dial Reading can be distinguished by a higher numerical content whereas Table Reading II is more heavily loaded on the Perceptual Speed factor.

The principal contribution of this analysis is in the identification of the Spatial Relations, Perceptual Speed, Visualization, and General Reasoning factors in the airman population. The additional tests permit a more complete definition of these factors than has been possible in previous analyses of the Airman Classification Battery alone. (From the authors' summary and conclusions)

Gordon, M. A., 1952a
A. W. Guida, and R. B. Lightfoot
COMPARISON OF THE VALIDITY COEFFICIENT INCLUDING AND EXCLUDING ELIMINEES. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. PERS 52-51, Dec. 1952. 6 p. (Project no. 503-001-0001; AD 7953).
UNCLASSIFIED

The validity of the Airman Classification Battery is determined in respect to the inclusion or exclusion of academic eliminees of the Control Tower Operator School. The criteria were final school grades and phase grades I and II. The validity of the Radio Operator Aptitude Index predictor for 194 graduates was reduced from 0.57 to 0.44 by the exclusion of the 75 eliminees. The largest difference (from 0.60 to 0.31) was obtained by the correlation of word knowledge with the final school grade. Air Force technical schools with high academic elimination rates should allow for the effect of eliminee exclusion on the validity of predictor variables. (AD abstract)

Gordon, M. A. 1952b
A METHOD OF ESTABLISHING MINIMUM QUALIFYING SCORES FOR ENTRANCE TO AIR FORCE TECHNICAL SCHOOLS. — Air Training Command. Human Resources Research Center. Personnel Research Lab., Lackland Air Force Base, Tex. Technical report no. 52-4, Nov. 1952. v+6 p. (Project no. 503-001-0001; TIP U25471)
UNCLASSIFIED

In this report an exploration has been made of the problem of setting cutoff points on aptitude indexes when the training programs to which men are to be assigned are arranged in order of priority. An attempt was made to establish a method whereby it could be determined whether the assignment of men to high-priority training schools would leave enough men qualified to fill the quotas of low-priority schools if cutoff scores are set at certain specified levels. In the case of these data the proposed cutoff points permitted a distribution of manpower to technical schools which was approximately such that all schools could be supplied with men who had at least the minimum

qualifying aptitude index. — Finally, it may be pointed out that the data necessary for setting cutoff points by the system described will not be available at the time when cutoff scores are fixed. However, data from previous years modified by a knowledge of trends should still permit the application of the method. Even when estimates of this kind are used, it seems reasonable to postulate that cutoff scores would be more adequately set by an application of the method described than by guesswork. (Author's summary considerations)

Gorlin, R. see Lewis, B. M., 1952, 1952a
Gourzis, J. T. see Bauer, R. O., 1952, 1952a
Gover, S. C. see Handford, S. W., 1952

Graettinger, J. S. 1952
A COMPARISON OF THE ELECTROCARDIOGRAPHIC ALTERATIONS PRODUCED BY ATROPINE SULFATE WITH THOSE CAUSED BY A CHANGE FROM THE UPRIGHT POSITION. — Naval School of Aviation Medicine, Pensacola, Fla. Oct. 29, 1952. 10+10 p. (Project report no. NM 001 057.06.01; AD 7795). UNCLASSIFIED

Analyses were made of electrocardiographic alterations produced by intravenous administration of 0.65, 1.3, or 2.0 mg of atropine sulfate to 14 healthy reclining subjects, and the electrocardiographic changes resulting from the atropine were compared with those recorded after the subjects stood for 5 minutes. No significant difference was observed between the effects on the PR interval by the standing and the atropine; there was no correlation between the change in the PR interval and heart rate or blood pressure. Increasing the atropine dose from 0.65 to 1.3 mg. produced a greater heart-rate acceleration, but a further increase to 2.0 mg. produced no further increase in the acceleration. Both 1.3 and 2.0 mg. of atropine resulted in more rapid heart rates than did the effects of standing. A-V nodal rhythm occurred in 4 subjects after being given 0.65 mg. atropine. The effect of atropine is discussed in terms of conduction, vagal paralysis, and the shift to A-V nodal rhythm. (AD abstract)

Graf, K. 1952
[ON PREDISPOSITION TO HEARING DISORDERS FOLLOWING EXPOSURE TO ACOUSTIC TRAUMA (BLAST INJURY)] Zur Frage der Disposition zu Höhrstörungen beim akustischen Trauma (Knall-Trauma). — Practica oto-rhino-laryngologica (Basel), 14 (4-5): 221-238. 1952. In German. DSG

Hearing disorders caused by discharge of fire weapons were examined in 63 members of the Swiss Army. The type of weapon used, the phase of military service engaged in when the injury occurred, and the specific circumstances (exposed to one or several shots) were carefully recorded. Otoscopic and functional findings were analyzed in detail. In subjects who had an anatomically and functionally normal otological system, the effects of acoustic trauma were very seldom permanent; individual variations of sensitivity (e.g., duration of hearing a whistling sound following the blast) were noted. In the majority of the soldiers tested (40 of 63), however, a pathological disposition to loss of hearing existed preceding the blast. These subjects were not aware of any previous deficiency, although the examinations suggested the preexistence of chronic catarrhal otitis media in most cases; pain felt in the ear after the acoustic trauma made these soldiers conscious of their condition. In some cases it was difficult to ascertain whether the partial loss of hearing was in part or wholly due to the blast injury.

Gragg, D. B. 1952
CONVERSION TABLES FOR AIRMAN QUALIFYING EXAMINATION SCORES AND COMPARABLE SCORES ON OTHER SELECTED AIR FORCE AND ARMY TESTS. — Air Training Command. Human Resources Research Center. Personnel Research Lab., Lackland Air Force Base, Tex. Technical report no. 52-13, Dec. 1952. v+29 p. (Project no. 503-002-0002; AD 3675). PB 117879

Conversion tables are presented which are designed primarily for use by Army and Air Force personnel in estimating, from available scores of either of the two armed services, scores needed for use in classification and assignment either in the serviceman's parent service or the other armed service. A secondary use of the tables is for estimating proportions in various aptitude categories in manpower studies. (AD abstract)

Graham, C. H. see Brown, John L., 1952; Hsia, Y., 1952

Graham, F. 1952
NUMBER OF PASSENGERS IN TOURIST PLANES REDUCED BY ONE LINE AS SAFETY MEASURE. — New York Times, Nov. 30, 1952, section II: 27 (col. 2). 1952. DLC

W. A. Patterson, president of United Air Lines, has announced a reduction of seats in the company's DC-4 tourist planes, from 66 to 54. This action was based on the findings of a research group composed of staff members of the United Air Lines and of the Cornell Aeronautical Laboratory at Buffalo, New York. The group's report was to the effect that the narrowness of the isle in the passenger's cabin prevented safe discharging of passengers through doorway and hatches in less than 3 to 3 1/2 minutes. Other airlines offering tourist-class service did not go along with Mr. Patterson's voluntary move and suggestions.

Grandpierre, R. 1952
and C. Franck
THE PARADOXICAL ACTION OF OXYGEN. — Jour. Aviation Med., 23 (2): 181-185. 1952. DLC (TL555.A1A4, v. 23)

The so-called paradoxical effect of oxygen consists of certain disturbances which set in when the state of anoxemia is suddenly interrupted

by breathing of normal air or of oxygen. The disturbances involve the respiratory system (diminution of breathing, or apnea), the circulatory system (fall of blood pressure, bradycardia), neuromuscular performance (deterioration of writing test), and mental functions (faulty judgment, even loss of consciousness). These disturbances are much milder or absent if the anoxemia is abolished gradually rather than suddenly. The necessity of avoiding sudden reoxygenation of anoxemic flyers is discussed.

Grandpierre, R. 1952a
and F. Violette
[VARIATIONS IN THE RESPIRATORY AND CIRCULATORY EFFECTS OF PRESSURE BREATHING ACCORDING TO THE SPEED WITH WHICH IT IS ESTABLISHED] Variations des effets respiratoires et circulatoires suivant la vitesse d'établissement de la respiration en surpression. — Médecine aéronautique (Paris), 7 (4): 481-487. 1952. In French. DLC (TL555. M394, v. 7)

The respiratory and circulatory effects of pressure breathing were studied in chloralosed dogs which had a cannula inserted into the trachea. When the pulmonary pressure was increased rapidly (by 20 cm. water), temporary apnea set in, the duration of which varied individually; the arterial pressure decreased rapidly but recovered partially; the venous pressure increased gradually; and the cerebrospinal fluid pressure rose by the same value as that of the air pressure. — When pressure breathing was started abruptly in the course of explosive decompression (from a simulated altitude of 9,000 m. to that of 15,000 m.), the respiratory and circulatory disturbances were more accentuated. Slow introduction of pressure breathing during explosive decompression, however, resulted in less pronounced disturbances.

The phenomena observed on dogs are also applicable to man. When pressure breathing is used to combat anoxia at high altitudes, it should not be started abruptly, but should be applied gradually and progressively.

Grandpierre, R., 1952b
C. Franck and P. Arnould
[INCREASE IN THE ANOXIA RESISTANCE OF THE CHLORALOSED DOG FOLLOWING ADMINISTRATION OF PROCAINE] Augmentation de la résistance à l'anoxie du chien chloralosé après administration de procaïne. — Médecine aéronautique (Paris), 7 (4): 501-506. 1952. In French. DLC (TL555. M394, v. 7)

Tests of anoxia resistance were carried out on dogs chloralosed "to the limit". The animals inhaled a mixture of 1 to 2% oxygen in nitrogen until anoxemic apnea set in. Then they were given fresh air by artificial respiration. When 20-25 mg. procaine per kg. body weight was administered intravenously, the resistance to acute anoxia showed a marked increase in spite of the suppression of anoxic hyperadrenalemia and of anoxic hypertension. This increase in resistance was probably due to the effect of the procaine on both the central and peripheral mechanisms of the respiratory system.

Grandpierre, R., 1952c
C. Franck, R. Lemaire, and F. Violette
[RESPIRATORY AND CIRCULATORY CHANGES CAUSED BY BREATHING UNDER PRESSURE] Les modifications respiratoires et circulatoires provoquées par la respiration sous pression. — Journal de physiologie (Paris), 44 (2): 250-253. In French. DLC (QP1. J7, v. 44)

Anesthetized or unanesthetized dogs breathing through a tracheal cannula were exposed to a sudden increase of intrapulmonary pressure (20 cm. water in 1 second). Respiration stopped for as long as one minute and was resumed at a slower rhythm and with forceful exhalations; arterial pressure increased brusquely, then dropped to half of its initial value and slowly rose again; venous pressure increased within 3 seconds to a value which exceeded the initial pressure by about 20 cm. water; the cerebrospinal fluid pressure increased immediately at the same rate as the intrapulmonary pressure; and an increase in the volume of the thoracic cavity and a lowering of the diaphragm and the heart were observed. — When the intrapulmonary pressure was increased slowly, the same symptoms occurred but in a less pronounced manner. Cutting of the nerves of Hering [carotid sinus nerves] and the pneumogastric nerves resulted in disappearance of the apnea and in continuation of the normal breathing rhythm, while the other disturbances remained unchanged.

Grandpierre, R. 1952d
and C. Franck
[ARTIFICIAL RESPIRATION BY ELECTRIC STIMULATION OF THE PHRENIC NERVE: ESSAY ON ITS APPLICATION IN THE TREATMENT OF ANOXEMIC SYNCOPE] Respiration artificielle par excitation électrique du nerf phrénique: essais d'application au traitement de la syncope anoxémique. — Médecine aéronautique (Paris), 7 (3): 237-248. 1952. In French. DLC (TL555. M394, v. 7)

The effects of faradic stimulation of the phrenic nerve were studied in chloralosed dogs. Continuous stimulation brought about a temporary apnea, rhythmical stimulation of the nerve (either directly or through the skin) resulted in respiratory movements. The possible application of electrophrenic artificial respiration in cases of anoxemic syncope is discussed.

Grandpierre, R., 1952e
C. Franck, and R. Lemaire
MODIFICATIONS OF EXCITABILITY OF RESPIRATORY CENTERS IN THE COURSE OF ANOXEMIA; CONSEQUENCES OF MODIFICATIONS IN THE TREATMENT OF ANOXEMIC SYNCOPE. — Jour. Aviation Med., 23 (6): 566-568. 1952.
DLC (TL555. A1A4, v. 23)

During anoxemic apnea the reflex excitability of the respiratory centers is abolished and reappears only later following resuscitation either by artificial respiration or immediate administration of oxygen. The loss of the reflex excitability is due to a metabolic functional disorder of the cells of the respiratory centers.

Grandpierre, R., 1952f
P. LaBarthe, and R. Lemaire
[THE "PHYSICAL CONDITION" TESTS OF FLYING PERSONNEL AS RELATED TO FLYING IN MODERN COMBAT PLANES] Les tests de "forme physique" du personnel navigant dans leurs rapports avec le vol sur avions modernes de combat. — Annales belges de médecine militaire (Liège), 105 (1-2): 3-10. 1952. In French.
DSG (W1 AN3092, v. 105)

Basic requirements for tests designed to determine the physical aptitude and potential endurance of aviation candidates are outlined. Of primary concern is the examination of neuromuscular functions (reaction speed, sense of equilibrium, and orientation), as well as of the respiratory and cardio-vascular systems. Results should be expressible in numerical scores, accompanied by qualitative evaluations, particularly with regard to psychological factors. A number of such tests (about 20) are very briefly outlined.

Grandpierre, R., 1952g
R. Lemaire, and L. Baguenier-Desormeaux
[VOLUNTARY APNEA TEST: STUDY CONCERNING ITS VALUE IN THE SELECTION OF FLYING PERSONNEL] Le test d'apnée volontaire: recherches concernant sa valeur en tant que test de sélection du personnel navigant. — Médecine aéronautique (Paris), 7 (1): 3-22. 1952. In French.
DLC (TL555. M394, v. 7)

In an attempt to determine the correlation of voluntary apnea and the functions of the respiratory center, the authors investigated voluntary apnea on 60 subjects of both sexes, divided into three groups according to physical fitness. Blood oxygen and pulmonary movements were recorded simultaneously during the course of the experiment and plotted on overlaid graphs. The rate of reduction in blood oxygen varied depending on whether voluntary apnea was preceded by normal breathing or by forced deep inspiration and expiration, the greatest reduction being observed when apnea was initiated by forced expiration without preceding hyperventilation. In stressing the importance of psychological factors for the outcome of the oxygen-saturation curve (motivation for holding breath, apprehension of injurious effects, etc.) the authors point out the practical value of the test for diagnostic purposes in the study of personality patterns. Physical and psychological aptitude for flying is indicated when the decrease of blood oxygen is slow and when the subject is able to hold his breath for a relatively long time.

Grandpierre, R., 1952h
C. Franck, and P. Arnould
[VARIATIONS IN LUNG VENTILATION DURING SUCCESSIVE PERIODS OF ANOXIA] Variations du débit respiratoire au cours des épreuves successives d'anoxie. — Comptes rendus de la société de biologie, 146 (23-24): 1969-1970. 1952. In French.
DSG

Previous studies carried out on chloralosed dogs exposed to progressive decompression showed that the time span between the onset of anoxia and the arrest of respiration is constant for each individual animal and that the length of this time span is indicative of the animal's potential resistance to anoxia. Upon confirming these findings, the authors undertook additional measurements of the respiratory activity (at 5 to 30 minute intervals) during successive stages of decompression, and observed that the lung ventilation diminished. The physiological mechanism of the phenomenon is still under study. By way of hypothesis, the authors correlate the reduction of the ventilation with variations in the carbon dioxide tension of the blood.

Grandpierre, R., 1952i
C. Franck, and F. Violette
[EFFECTS OF CHANGES OF THE OXYGEN SATURATION OF THE ARTERIAL BLOOD ON THE CEREBROSPINAL FLUID PRESSURE] Influence of the variations of oxygen saturation of the (arterial) blood from pressure of the cephalorachidian fluid. — Jour. Aviation Med., 23 (5): 474-476. 1952. "Translation from the French."
DLC (TL555. A1A4, v. 23)

Changes of the cerebrospinal fluid pressure during progressive anoxemia were studied in chloralosed dogs. When anoxemia was induced by breathing of oxygen-deficient gas mixtures, the cerebrospinal fluid pressure increased gradually. When the anoxemic state was interrupted by inhalation of oxygen, the fluid pressure approached its normal level again; breathing air restored the normal pressure more slowly. If the anoxemia was not interrupted, the cerebrospinal fluid pressure continued to increase until respiratory arrest occurred; then it became stabilized for a short period, to decrease again (with decreasing arterial blood pressure) until the heart action stopped. After that, the decrease followed more or less that of the venous pressure.

Grandpierre, R., 1952j
C. Franck, and F. Violette
[CIRCULATORY CHANGES CAUSED BY RAPID VARIATIONS OF INTRA-PULMONARY PRESSURE] Modifications circulatoires entrainées par les variations rapides de pression intra-pulmonaire. — Comptes rendus de la Société de biologie (Paris), 146 (15-16): 1248-1250. 1952. In French.
DSG

Intrapulmonary overpressure, applied suddenly for short durations (1/4 to 1/10 of a second) to chloralosed dogs by means of a bellow connected to a Tissot cannula, produced a short phase of

hypertension which persisted through two consecutive cardiac cycles. This phase was followed at first by a brusque fall, and thereafter by a progressive rise of arterial pressure usually interrupted by a short second phase of hypotension. Arterial pressure then returned to its initial level. Simultaneous cutting of the nerves of Hering and the pneumogastric nerves eliminated the phase of secondary hypotension. This suggests the conclusion that the after-phase may be ascribed to neurovascular reflex action, in contrast to the other phases described, which may be due to the effects of overpressure on the pulmonary vascular system and on the heart.

Graybiel, A. 1952
and B. Clark
DURATION OF OCULOGYRAL ILLUSION AS A FUNCTION OF THE INTERVAL BETWEEN ANGULAR ACCELERATION AND DECELERATION. ITS SIGNIFICANCE IN TERMS OF DYNAMICS OF SEMI-CIRCULAR CANALS IN MAN. — Jour. Applied Physiol., 5 (4): 146-152. 1952.
DLC (AP1.J72, v. 5)

Subjects were placed in a Link Trainer which was modified to rotate only in the horizontal plane and could be rapidly arrested by a brake mechanism. The trainer was rotated at various rates of acceleration, and peak velocities were kept constant for a varying length of time (0, 10, 20, 30, and 60 seconds) before rapid deceleration was applied. The duration of first and second oculogyral effects (e.g. the apparent movement of a luminous object first in the direction of the turn and then in the opposite direction) reported by the subjects were timed to the nearest second. It was found that the duration of both oculogyral effects was proportional to the rate of acceleration and could be expressed as a function of the length of the constant-velocity interval between acceleration and deceleration: it increased rapidly after an interval of 0 to about 20 seconds, then remained almost constant (about 25 seconds), thus indicating a state of physiological adaptation. The findings are correlated with the physiological mechanism of the semicircular canals. In applying the data to conditions encountered by pilots during night flights it is concluded that similar illusory aftereffects may be expected after rotation of a plane about one of its axes and may impair spatial orientation to a minor degree.

Graybiel, A. 1952a
THE EFFECT ON VISION PRODUCED BY STIMULATION OF THE SEMICIRCULAR CANALS BY ANGULAR ACCELERATION AND STIMULATION OF THE OTOLITH ORGANS BY LINEAR ACCELERATION. — In: Physics and medicine of the upper atmosphere: a study of the aeropause, p. 494-508. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico Press, 1952. DLC (RC1050.U5, 1952)

The physiological mechanism of oculogyral and oculogravic illusions is briefly discussed. No evidence has been found to the effect that repeated angular acceleration would lead to habituation and decrease oculogyric illusion. Rapid changes from positive to negative acceleration result in decreased oculogyric illusion, but the aftereffect increases with the lengthening of intervals between changing accelerations. Experiments made in actual flight revealed that oculogyric illusions aid the pilot with regard to the orientation of the plane, but cause disorientation with regard to localization of objects outside the plane. Oculogravic illusions can be demonstrated using the human centrifuge. They manifest themselves in the fact that the subject perceives an apparent tilting of his chair and supporting structure while fixing his eyes on a small luminous object. Unlike oculogyric illusion (which is due to nystagmus), oculogravic illusion is independent of the movements of the eyeball.

Graybiel, A. 1952b
OCULOGRAVIC ILLUSION. — A.M.A. Arch. Ophthalmol., 48 (5): 605-615. 1952.
DSG (W1 A132, v. 48)

The oculogravic illusion is experienced in flight as well as in any other situation when a person is exposed to a change in direction of the gravitational forces acting on his body. The subject has a feeling of being tilted and of assuming a new position in space and is under the impression that objects in his visual field change position. Experiments were carried out with subjects sitting on a centrifuge (the cabin being darkened), fixating a dimly illuminated "star". The chair on which the subjects sat tilted at various angles to the axis of rotation. The following characteristics of oculogravic illusion on the part of the test subject were observed: (1) low threshold of perception; (2) perception of an apparent smooth gliding motion; (3) correspondence between rate of apparent movement and magnitude of apparent displacement; (4) no adaptation to apparent displacement; (5) lag of response in case of abrupt change in direction of resultant force; in extreme cases the response was no longer linear. The cause of the illusion is thought to be of a psycho-physiological nature.

Graybiel, A., 1952c
J. I. Niven, and T. E. Walsh
THE DIFFERENTIATION BETWEEN SYMPTOMS REFERABLE TO THE OTOLITH ORGANS AND SEMI-CIRCULAR CANALS IN PATIENTS WITH NON-SUPPURATIVE LABYRINTHITIS. — Naval School of Aviation Medicine, Naval Air Station, Pensacola, Fla. March 10, 1952. 7+2 p. (Project report no. NM 001 059.01.29; TIP U22327).
UNCLASSIFIED

The symptoms induced following stimulation of the semicircular canals are feelings of rotation and the apparent rotation of objects in the visual field. The chief symptoms induced by a change in direction of resultant force, which include stimulation of the otolith organs, are an apparent tilting of the body and the apparent displacement of objects so that they appear to assume a new position in space. Five patients with symptoms characteristic of non-suppurative labyrinthitis were largely

or wholly relieved following unilateral "labyrinthectomy" [i.e. application of a coagulating current to the medial wall of the vestibule of the labyrinth]. After recovery from the operation they were subjected to both angular and rectilinear accelerations, which stimulated respectively the sensory elements in the horizontal pair of semicircular canals and otolith organs. When their spontaneous symptoms were interpreted in the light of the induced symptoms, it became evident that the disturbances in equilibrium may be mainly referable to either one or both portions of the nonacoustic labyrinth. The spontaneous distrubances were mainly referable to the semi-circular canals in two cases, the otolith organs in one, and to both sensory organs in the remaining two. (Authors' summary)

Graybiel, A. 1952d
and J. I. Niven
THE ABSENCE OF RESIDUAL EFFECTS ATTRIBUTABLE TO THE OTOLITH ORGANS FOLLOWING UNILATERAL LABYRINTHECTOMY IN MAN. — Naval School of Aviation Medicine, Pensacola, Fla. Oct. 1952. 9+2 p. (Project report no. NM 001 059.01.33; TIP U25734).
UNCLASSIFIED

Five control and five unilaterally labyrinthectomized subjects were exposed to centripetal forces on a human centrifuge. Their ability to estimate apparent change in position of a visual object and change in body position during exposure to centripetal force was recorded. No significant differences between the subjects were revealed. Residual effects attributable to the unilateral destruction of the otolith organs were negligible. (TIP abstract)

Graybiel, A. see also Clark, B., 1952, 1952b; Packard, J. M., 1952, 1952a

Green, D. E. 1952
GROUP CORRELATION METHODS. — Air Research and Development Command. Human Resources Research Labs., Bolling Field, D. C. HRRL Memo report no. 27, Nov. 1952. 9 p. (AD 1138). PB 113166

Over-all technical-competence ratings of 53 B-29 mechanics by 14 supervisors and 14 assistant supervisors were analyzed to select a method of estimating the degree of relationship which most nearly approximates the true degree of agreement between judges. The following methods for estimating the reliability of ratings were applied to the data and examined: (1) the Pearson product-moment correlation coefficient computed for the total sample; (2) the product-moment correlation coefficients computed and averaged for each crew; (3) the average of the rank-order correlation coefficients for each crew; (4) the average of the intraclass correlation coefficients for each crew; (5) the within-group correlation coefficient for the whole group; and (6) the within-groups rank-order correlation coefficient for the entire group. Examination of each method was necessitated by the large variation in the resulting correlation coefficients. Method 1 appeared the least adequate, while methods 2, 3, and 4 were believed highly unstable because of the errors resulting from averaging. Method 5 appeared the most appropriate for determining the agreement between two judges, and method 6 seemed the most suitable for determining the agreement between the rankings of judges. (AD abstract)

Green, J. H. see Duke, H. N., 1952
Green, R. F. see Guilford, J. P., 1952

Grenell, R. G. 1952
CEREBRAL CORTICAL POTENTIALS IN ANOXIA. — Federation Proceedings, 11 (1 I): 59. 1952. DSG

The effects of anoxia on the activity of cortical neurons were observed in cats breathing air, air mixtures containing 10% or 7% oxygen, or 100% nitrogen. Two types of responses to direct electrical stimulation were recorded: the "dendritic" and "neuronal" responses, and the transcallosal response. The effects of anoxia on the components of these responses are under study, with particular regard to the relative susceptibility of parts of the normal network to anoxia. Preliminary experiments with animals breathing 100% nitrogen showed that the transcallosal response was more markedly affected than the neuronal component of the ipsilateral response.

Grether, W. F. see Brown, Kenneth, T., 1952

Grice, G. R. 1952
and B. Reynolds
EFFECT OF VARYING AMOUNTS OF REST ON CONVENTIONAL AND BILATERAL TRANSFER "REMINISCENCE". — Jour. Exper. Psychol., 44 (4): 247-252. 1952. DLC (BFI. J6, v. 44)
Reprint issued also as Research bulletin 52-42 of Air Training Command. Human Resources Research Center., Lackland Air Force Base, Tex. Dec. 1952 (AD 4221).

The functional relation between reminiscence and length of rest in rotary pursuit learning was studied in 432 right-handed airmen basic trainees. In two parallel tests, rest periods of 10 sec., and 1, 3, 5, and 10 minutes were introduced after fifteen 30-sec. trials. In the first experiment, the subject practiced with his left hand before and after the rest, while in the second experiment he started out with the right hand and used his left hand after the rest. In both experiments, reminiscence increased with the length of rest at least up to 10 min. Subjects using the same hand before and after rest displayed a more marked gain in reminiscence; those using alternate hands showed less regularity under the same conditions. With continued practice, however, the superiority of the rest groups disappeared in both experiments.

Grierson-Jackson, W., 1952
A. M. Beach, and B. P. Ross
FLIGHT FEEDING IN THE CANADIAN FORCES. — Defence Research Medical Labs. (Canada),

Toronto, Ontario. DR Report no. 60, Nov. 1952. vi+109 p. (AD 16 325). UNCLASSIFIED

A survey was made of flight feeding in the Canadian Forces and of methods and equipment available or in use in other countries. The team studying flight feeding spent three months and a half touring Canada, Britain, and the U. S. Service, civilian, and commercial establishments were visted or contacted. Flight feeding in the Canadian Forces was not believed to have reached the high standards set by other forms of messing because of (1) the lack of a comprehensive program, (2) cumbersome regulations, (3) tortuous administrative channels, (4) general lack of awareness of the urgency and importance of flight feeding, (5) lack of suitable minor items in the scale of issue, and (6) need for triservice standardization of flight feeding. Recommendations by the study team stress the need for development of the box-lunch meal. Flight-line kitchens are not advocated for immediate development. Precooked hot or frozen meals and elaborate aircraft galleys do not appear necessary or practical within the immediate future. It is strongly recommended that no distinction be made between living-in and living-out personnel in the issue of pre-, post-, and in-flight meals. The use of common methods and standards of flight feeding in all three services is suggested. (AD abstract)

Grognot, P. A. 1952
[PHYSIOPATHOLOGICAL EFFECTS INDUCED BY ULTRASONIC VIBRATIONS OF 25,000 HERTZ TRANSMITTED THROUGH AIR] Effets physio-pathologiques provoqués par les vibrations ultrasonores de 25,000 Hz transmises par l'air. — Médecine aéronautique (Paris), 7 (4): 364-370. 1952. In French. DLC (TL555. M394, v. 7)

The effects of exposure of human subjects to ultrasonic vibration of 25,000 Hertz [25,000 cycles per second] were studied. Exposure of the entire body, without shielding, resulted in a marked increase of eosinophil cells in the blood and a decrease of arterial pressure. A minimum intensity of 95 decibels was needed to produce a noticeable change in eosinophil number. When only the lower arm or the epigastric region were exposed to the vibration, increase in eosinophil cells occurred in only 50% of the subjects. — It is interesting to note that deaf-mutes or people having hearing disorders did not have any eosinophil increase, no matter what part of the body was exposed to ultrasonic vibration. — Guinea pigs and rats exposed to the same vibration developed cellular lesions in the nervous system which resulted in psychomotor disturbances.

Grognot, P. [A.] 1952a
[REACTIONS OF THE BLOOD AND OF THE CIRCULATORY SYSTEM INDUCED BY ULTRASONIC VIBRATIONS TRANSMITTED THROUGH AIR] Réactions sanguines et circulatoires provoquées par les vibrations ultrasonores transmises dans l'air. — Journal de physiologie (Paris), 44 (2): 255-259. 1952. In French. DLC (QP1. J7, v. 44)

Normally dressed healthy test subjects with their faces uncovered were exposed to ultrasonic vibrations of 25 kilohertz [25,000 cycles per second] at a constant intensity of 115 decibels. The earducts were protected by ear stoppers against side noises produced by the apparatus. After one hour of exposure, an increase in eosinophils ranging from 30 to 50%, accompanied by a decrease of arterial tension (1.5 mm. Hg), was observed in 86% of the subjects. Experiments were repeated on persons with pharyngeal and parasitic infections, with similar results. In subsequent experiments it was found that a minimum intensity of 95 decibels was required to effect an increase in eosinophils. In certain cases a lessening of the rate of eosinophil increase was observed when other parts besides the face were subjected to repeated exposures. Supersonic vibration aimed at the epigastric region did not cause eosinophil increase. The paper concludes with an attempt of presenting a physiological interpretation of the phenomenon.

Grognot, P. A. 1952b
and F. Violette
[ANATOMO-PATHOLOGICAL LESIONS OF THE CEREBRAL CORTEX AND OF THE LUNGS OF DOGS SUBJECTED TO EXPLOSIVE DECOMPRESSION (FROM 9,000 TO 15,000 m.)] Lésions anatomo-pathologiques au niveau du cortex cérébral et du poumon de chien soumis a une decompression explosive (9.000 a 15.000 m.). — Médecine aéronautique (Paris), 7 (4): 476-480. 1952. In French. DLC (TL555. M394, v. 7)

Dogs were subjected to explosive decompression from a simulated altitude of 9,000 m. to that of 15,000 m. and were then immediately recompressed to ground level. The animals withstood the procedure fairly well, though some lost consciousness. The lung tissue and parts of the cerebral cortex of animals killed immediately after the experiment or several days later, were studied microscopically. Injuries to the lungs (torn interalveolar partitions, circulatory stasis) and brain (hyperchromatic cells, microhemorrhages) were relatively minor.

Grognot, P. [A.] 1952c
[MODIFICATIONS IN THE LEUKOCYTE COUNT UNDER THE INFLUENCE OF DECREASED ATMOSPHERIC PRESSURE] Modifications du nombre des globules blancs du sang sous l'influence de la dépression atmosphérique. — Comptes rendus de la société de biologie, 146 (15-16): 1241-1243. 1952. In French. DSG

A group of 80 young and healthy subjects was exposed to a simulated altitude of 267 mm. Hg (equivalent of 8000 m.) for one hour. The number of lymphocytes decreased 20-40%, while the number of true leukocytes increased very slightly. In order to determine the threshold altitude for the occurrence of lymphopenia, a number of subjects were exposed to a graduated series of decompressions. The threshold altitude was found to lie between 5,000 and 5,500 m., and the mini-

mum duration to provoke a decrease in lymphocyte number at that altitude was found to be 35-40 minutes. Maximum values of lymphopenia were observed between 1 hour 30 minutes and 2 hours after the conclusion of decompression and return to ground level. Return to normal leukocyte values was reached after 4 to 5 hours.

Gronow, D. G. C. see Bartlett, D. J., 1952; Cotes, J. E., 1952, 1952a

Groot, S. G. de, 1952
J. M. Dodge, and Joann Smith
FACTORS IN NIGHT VISION SENSITIVITY: THE EFFECT OF BRIGHTNESS. — Naval Medical Research Lab., New London, Conn. Report no. 194 (vol. 11, no. 11), March 18, 1952. 17 p. (Project report no. NM 008 041.09.04; TIP U65868). UNCLASSIFIED

Night sensitivity of the eye was explored by using a spot of light of different brightnesses presented at nine points between one and twenty-seven degrees from fixation in each of four positions: up, down, right, and left. A total of 13,000 judgments were made by three observers.

Overall sensitivity was found to increase rapidly to a peak between seven and twelve degrees from fixation and then to decrease steadily into the periphery. Sensitivity in the upper, lower, nasal, and temporal quadrants follow the same general pattern but with certain specific differences. The nasal quadrant had the best sensitivity over the largest are... (Authors' abstract)

Gross, A. see Malmejac, J., 1952e

Gross, F. 1952
and H. W. Romberg
[STUDIES ON THE SIMULTANEOUS EFFECTS OF COLD AND OXYGEN DEFICIENCY ON MAN. I. PARACHUTE JUMPING FROM HIGH ALTITUDES AT LOW TEMPERATURE AND AFTER EXPOSURE TO COLD] Ricerche sull' effetto comtemporaneo del freddo e della mancanza di ossigeno sull' uomo. I. Il lancio con paracadute da grandi altezze a temperatura bassa e dopo raffreddamento. — Rivista di medicina aeronautica (Roma), 15 (1): 13-34. 1952. In Italian, with English, French, Spanish, and German summaries (p. 30-34). DLC (TL555.A1R5, v. 15)

Opening of the parachute at high altitudes involves many physiological problems. As the opening immediately after jumping results in very severe anoxia, it is advisable to descend to an altitude of 7000-6000 meters before this operation is released. Experiments carried out in a decompression chamber at low temperature (down to -45°C) revealed that exposure (1-70 minutes) decreases the resistance to high altitude in proportion to the degree of cooling.

Factors of the local climate in the airplane are discussed in relation to their effect on human heat balance. Relations between the onset of altitude sickness, duration of refrigeration, and duration of descent are studied, showing that a fairly long exposure to cold reduces resistance to anoxia. During hypothermia, the metabolic rate is elevated and the oxygen-binding ability of hemoglobin is modified. The author suggests that an oxygen apparatus be carried by the parachutist, and that the opening of the parachute be effected by an automatic barometric control.

Gross, F. 1952a
and H. W. Romberg
[STUDIES ON THE SIMULTANEOUS EFFECTS OF COLD AND OXYGEN DEFICIENCY ON MAN II. THE EFFECT OF COLD AND OF REFRIGERATION ON THE TOLERANCE OF MEDIUM ALTITUDES] Ricerche sull' effetto contemporaneo del freddo e della mancanza di ossigeno sull' uomo. II. L' influenza del freddo e del raffreddamento sulla tolleranza all' altitudine a quote medie. — Rivista di medicina aeronautica (Roma), 15 (2): 212-230. 1952. In Italian, with English, French, Spanish, and German summaries (p. 227-230). DLC (TL555.A1R5, v. 15)

Subjects were exposed to cold (-35° to -45°C) in a decompression chamber for 2 to 60 minutes. After prolonged exposure to cold, the reaction to medium altitude differed from the results obtained in similar tests carried out at high altitudes. The first symptoms of oxygen deficiency appeared sooner than usual; after the refrigeration had reached a certain degree, however, a considerable improvement in anoxia tolerance was apparent. Even after reaching an altitude of 7500 meters (22,860 feet) none of the subjects became incapacitated.

The thermoregulatory function of the organism as affected by changes of the environmental temperature is discussed. Considering the total body circulation, the main organs seem to have a priority for their blood supply as compared to the skin or the extremities. The necessity of further investigation of the relationship between circulation and metabolism is emphasized.

Gubernale, A. 1952
[ACCOUNT OF A JET FLIGHT] Relazione su un volo a reazione. — Rivista di medicina aeronautica (Roma), 15 (4): 521-526. 1952. In Italian, with English, French, Spanish, and German summaries (p. 525-526). DSG

Observations and experiences of the author aboard a jet propelled aircraft, F-80, are analyzed. The pressurization of the cockpit (automatically controlled) went into effect at 10,000 ft. and remained unchanged up to 18,000 ft. From this altitude on, the pressure differential was maintained at 2.75 pounds per square inch. During the first part of the flight, up to an altitude of 26,000 ft., no disturbing symptoms were experienced and respiration and pulse were normal. In the second part of the flight, however, acrobatic maneuvers were carried out at an altitude of 13,000 ft. The effects of positive acceleration were a sensation of being nailed to the seat, heaviness of the extremities, and stiffness of the muscles. When 4 g was reached, it felt as if all the organs would be pulled downwards and it was difficult to breath.

When acceleration decreased, all these symptoms disappeared. Noise and vibration did not have any disturbing effects. As to the effects of negative acceleration, the author felt his resistance progressively decreasing, terminating in exhaustion and nausea.

Guedry, F. E. 1952
RELIABILITY OF RESULTS PREVIOUSLY REPORTED: THE INFLUENCE OF VISUAL STIMULATION ON HABITUATION TO ROTATION. — June 1952. 8 p. Tulane Univ., New Orleans, La. (Contract N7onr-434, [Task order 1]); issued by Naval School of Aviation Medicine, Pensacola, Fla. (Project report no. NM 001 063.01.25; Joint project report no. 25) (TIP U23935). UNCLASSIFIED

The major conditions of an investigation by Brown and Guedry (Jour. General Psychol., 45: 151-161, 1951) were repeated. A Link trainer, rotating about its vertical axis for 60 sec. at 20 r.p.m., was the principal item of apparatus. It carried a black box, faintly illuminated, fastened 2 ft. from the subject's head. The 24 subjects were divided into 2 groups of 12 each. Group I was subjected to 20 trials in which no overhead illumination was used until after the postrotational effect was ended. Group II's trials were similar except that the experimental room was illuminated by an overhead light for a 5-sec. period which started 2 sec. after the cessation of of rotation. Group II subjects exhibited more habituation to rotation; this verified the results of Brown and Guedry. A brief period of room illumination interposed during the postrotational period apparently reduced the duration of illusory effects. (TIP abstract)

Guedry, F. E., 1952a
J. T. Ray, and J. I. Niven
THE INFLUENCE OF VISUAL ORIENTATION ON APPARENT BODILY ROTATION FOLLOWING ACTUAL ROTATION. — Jan. 14, 1952, 5 p. Tulane Univ., New Orleans, La. (Contract N7onr-434, Task order 1); and Naval School of Aviation Medicine, Pensacola, Fla. (Project report no. NM 001 063. 01. 23). Joint report no. 23. (TIP U21937). UNCLASSIFIED

Three subjects were each rotated in the horizontal plane in a modified Link Trainer for 1-minute periods in alternating illuminated and dark surroundings. The time for acceleration to 20 r.p.m. was 15 seconds; for deceleration, 0.5 seconds. The subjects reported the end of the first postrotational effect and the beginning of the the second by pressing a key which flashed a light in the control room. The duration of the first effect was always less under conditions of illumination. The results do not support the concept that postrotational perception of apparent body rotation results from tracking of images over the retina. (TIP abstract)

Guedry, F. E. see also Thetford, P. E., 1952
Guida, A. W. see Gordon, M. A., 1952a

Guilbert, E. A. 1952
BACKWARD SEATING. — SAE Jour., 60 (6): 56. 1952. DLC (TL1. S5, v. 60)

The safety belt presently in use by most airlines does not offer adequate protection against head injuries. In case of crash the torso acts as a weighted lever driving the 10-lb. human head forward and subjecting it to a severe impact. Rear-facing seating, properly designed to support the head, would be the best possible solution to prevent head injuries. Such seating design has been initiated tentatively in military air transportation on Boeing C-97's. The seats can take a 16 g forward load based on a passenger weight of 225 lb. At a normal passenger weight of 175 lb., the forward g strength increases to about 24 g. Introduction of such a seat arrangement in commercial air transportation will meet with passenger resistance, but the safety factor involved should be a strong enough point to overcome it.

Guild, S. R. 1952
EAR LESIONS CAUSED BY ACOUSTIC TRAUMA. — A. M. A. Arch. Indus. Hyg. and Occupational Med., 5 (2): 121-123. 1952. DLC (RC963. A14)

This is a résumé of an illustrated talk delivered at the Conference on Problems of Noise in Industry at Atlantic City, N. J., April 23, 1951. Contrary to popular belief, injuries of the ear due to noise are not confined to the ear drum, but affect also the inner ear. The truly serious injury to an ear exposed to intense sound is to its specialized neuroepithelial receptor, the organ of Corti (destruction of the hair cells, particularly the outer ones). In extreme cases, the injury may lead to complete destruction of all epithelial cells in parts of the organ of Corti. Secondary to the destruction of hair cells, changes may occur in the ganglion cells of the nerve fibers which terminate in the hair cells and in the nerve fibers themselves. There is no evidence that destroyed hair cells can be replaced or regenerated.

Guild, S. R. 1952a
EFFECTS OF SOUND: PATHOLOGICAL—INCLUDING HEARING LOSS. — In: Noise—causes, effects, measurement, costs, control, p. 77-79. Ann Arbor, Mich.: Univ. of Mich. Press, 1952. DLC (RA772. N7M5)

Acoustic trauma results in a loss of hearing of high-pitched sounds, usually above the speech range (upper limit, 3000 c.p.s.). Recovery from temporary loss of hearing may occur in seconds, unless the loss is caused by an extremely intense noise or a blast in which case it will be extended over a longer time. Organic changes connected with the impairment of hearing acuity are presumably due to metabolic processes rather than to structural lesions. If a subject is exposed to injurious sounds for a considerable time, permanent impairment of hearing may develop. Serious lesions following acoustic trauma consist of the destruction of hair cells of the organ of Corti (suddenly after detonation and gradually after ex-

cessive noise); the outer hair cells are more susceptible to injury than the inner hair cells. In very severe acoustic injury, when both groups of hair cells are affected, a degeneration of all epithelial cells may take place in parts of the organ of Corti and the nerve fibers connected to the hair cells may undergo atrophic changes. These changes are always limited to those fibers of the auditory nerve which innervate the cochlea.

Guilford, J. P., 1952
R. F. Green, P. R. Christensen,
A. F. Hertzka, and N. W. Kettner
A FACTOR-ANALYTIC STUDY OF NAVY REASONING TESTS WITH THE AIR FORCE AIRCREW CLASSIFICATION BATTERY. — Univ. of California. Psychological Lab., Los Angeles. Report no. 6 on Studies of Aptitudes of High-Level Personnel, June 1952. 23 p. (Contract N6onr-23810; TIP U23391). PB 107205

This study was conducted to (1) obtain additional information concerning the analysis of the Air Force Aircrew Classification Battery A (I); (2) define the reasoning content of the 1947 Aircrew Classification Battery (II); and (3) link these studies with similar research at the Univ. of North Carolina. A total of 54 tests, designated battery B, were administered to 3 pilot-training classes. General reasoning (GR), eduction of correlates (EC), eduction of perceptual relations (PR), and eduction of conceptual relations (CR) was considered in the domain of reasoning. Doubt was expressed as to whether logical reasoning (LR) belonged in the reasoning domain or, along with judgment (J), in the evaluative category; both factors were identified. Verbal comprehension (V), numerical facility (N), perceptual speed (P), visualization (Vz), spatial orientation (SO), psychomotor coordination (PC), mechanical knowledge (MK), socio-economic background (SB), and symbol manipulation (SM) were named. A last factor was tentatively identified as attention to perceptual detail. Only GR, V, P, Vz, J, and attention to perceptual detail were common to the experimental and AF tests. None of the tests appeared to contribute positively to the testing of the hypotheses or to the clarification of factor structure. (From TIP abstract)

Guillemin, V. 1952
and P. Wechsberg
PHYSIOLOGICAL EFFECTS OF MECHANICAL VIBRATION. — Amer. Jour. Physiol., 171 (3): 730-731. 1952. DLC (QP1.A5, v. 171)

Albino rats were kept in pens having vibrating floors made of aluminum rods, thus affecting primarily the paws of the animals. The frequency of the vibration was 3600 and 7200 cycles per minute, with accelerations of 8-9 g, for 12 hours daily with a total exposure time of about 1000 hours. Results of the experiment indicated deficient vascular function (engorgement of paw capillaries) measured by the delay in the rewarming of the hind paws after chilling. Forty-five minutes were needed to rewarm the paws of the untreated rats; after 700 hours' exposure to vibration, 90 minutes more was needed in 50% of the rats vibrated at 3600 cycles and in 75% of those vibrated at 7200 c.p.m. — The group of rats subjected for 1000 hours to a vibration of 3600 c.p.s. showed complete recovery after 30 days of rest; when the exposure was renewed, all pathological symptoms promply reappeared.

Guimaraes, G. 1952
[PUBLIC HEALTH IN AVIATION: PREVENTION OF EPIDEMICS] Saúde pública aérea: profilaxia das epidemías. — Revista médica da aeronáutica (Rio de Janeiro), 4 (1): 63-70. 1952. In Portuguese.
DSG (W1 RE609, v. 4)

The public health measures necessary to prevent the spreading of communicable diseases by air travel are discussed. In The Hague, in 1933, representatives of 28 nations agreed upon the following measures: inspection and vaccination of the aircrew and passengers, isolation of those who are susceptible to being infected, and sanitary supervision and disinfection of the airplanes (detection of vectors). — Cholera, yellow fever, plague, typhus, and smallpox are the infectious diseases most likely to be introduced by plane to Brazil. With regard to sanitary aspects, airports in Brazil are classified as airports authorized for entering and leaving the country; limited airports in regions with endemic disease; special airports where an epidemic has been overcome; and anti-pest airports where planes are disinfected to rid them of insects. The public health measures of the airports are closely tied in with the general public health system of the entire country.

Gulley, W. E. 1952
NIGHT VISION TRAINING AT THE USAF SCHOOL OF AVIATION MEDICINE. — Jour. Aviation Med., 23 (5): 490-494, 529. 1952.
DLC (TL555.A1A4, v. 23)

Four different night vision training devices used at the USAF School of Aviation Medicine are described. Each instrument is a projector portraying typical night outdoor activities at levels of illumination corresponding to a starlit night. Silhouettes are used to demonstrate in a practical way the phenomena of dark and night adaptation. The success of the training program depends primarily upon the ingenuity of the instructor who must encourage moderate discussion and competition among the students.

Gulley, W. E., 1952a
T. C. Leininger, and J. G. Wells
PRESCRIPTION SPECTACLES FOR FLYING PERSONNEL. — School of Aviation Medicine, Randolph Field, Tex. Special report, Nov. 1952. 6 p. (AD 3217). UNCLASSIFIED

The night vision of pilots requiring corrective spectacles was improved by increasing the lens size to fit standard Air Force-type sunglass frames, and by coating the lenses with MgF_2 until a neutral purple color was obtained. The

frame dimensions and the coating process are included. (AD abstract)

Gumbel, E. J. 1952
A STUDY OF DEPTH PERCEPTION IN THE LIGHT AND DARK ADAPTED EYE. — Amer. Jour. Optometry, 29 (12): 613-623. 1952.
DSG

An experimental study aimed at determining the differences between dominant and nondominant monocular and binocular perception, yielded the following results: (1) a striking superiority was found of binocular vision in terms of accuracy and response; (2) no set pattern of depth discrimination could be established in monocular vision, neither in the light- nor dark-adapted state; (3) the superiority of cone over rod function in depth perception was shown; and (4) binocular depth perception in the dark-adapted eye was found to exist rudimentarily below the cone-rod threshold.

Haber, F. 1952
BAILOUT AT VERY HIGH ALTITUDES. — Jour. Aviation Med., 23 (4): 322-329. 1952.
DLC (TL555.A1A4, v. 23)

Flight in the border zone of space (in the "aeropause") will pose special problems with regard to bailout. At an altitude of 300,000 feet, the air is rarified to about one-millionth its density at sea level. Flight will be at very high speeds (10-20 Mach). The speeds and trajectories of bodies bailing out from moving aircraft or falling free from an altitude of 300,000 feet are discussed and presented graphically. The speed of a falling body first increases until the denser layers of the atmosphere are reached; the air resistance (wind blast) then decelerates the falling body. This deceleration, which may reach several g, is proportional to the velocity of the body. Capsules for escape from very high altitudes should, therefore, be equipped with air brakes or small parachutes. — Another problem encountered in very high altitude escape is the aerodynamic heating at high speeds (e.g., at Mach 10, 5,000 to 8,000° F.). After deceleration, on the other hand, the body loses heat to the surrounding air.

Haber, F. 1952a
and H. Strughold
[PHYSICS AND PHYSIOLOGY OF EXPLOSIVE DECOMPRESSION IN SPACE] Physik und Physiologie des Druckstürzes im Weltenraum. — Weltraumfahrt (Frankfurt), 1952 (4): 118-120. 1952. In German.
(DLC TL789.W45, 1952)

The "time of useful consciousness" (or "time reserve") following explosive decompression decreases with increasing altitude. At an altitude of 8 kilometers it amounts to 2-3 minutes and reaches a minimum value of 13-15 seconds at around 15 km. This value remains constant at higher elevations. It follows that space-equivalent conditions with regard to time reserve prevail at any point beyond 15 km. of altitude.

Haber, F. 1952b
STUDY ON SUBGRAVITY STATES. — School of Aviation Medicine, Randolph Field, Tex. April 1952. iii+9 p. (Project no. 21-34-003, Report no. 1; TIP U21307). UNCLASSIFIED

Equations are derived for calculating the duration of gravity-free or subgravity states as functions of gravity and initial speed or gravity and elevation. Plots are given for (1) minimum speed required as a function of gravity for different initial angles of climb and an initial velocity of 450 m.p.h., (2) speed as a function of time for 0.0 and 0.5 g, (3) duration of subgravity flights for various initial angles of climb at an initial speed of 450 m.p.h., and (4) two trajectories of flight for 0.0 and 0.5-g states, at an initial angle of climb of 45° and initial speed of 450 m.p.h. An airplane with an initial speed of 450 m.p.h. makes possible the maintenance of zero gravity for 35 sec. (TIP abstract)

Haber, H. 1952
MANNED FLIGHT AT THE BORDERS OF SPACE: THE HUMAN FACTOR OF MANNED ROCKET FLIGHT. — Jour. Amer. Rocket Soc., 22 (5): 269-276, 283. 1952.
DLC (TL780.A613, v. 22)

The properties of the atmosphere in relation to high-altitude and interplanetary craft and to the human body are briefly discussed in the following aspects: (1) it contributes to respiration; (2) prevents boiling of body fluids; (3) absorbs heavy primaries of cosmic radiation; (4) absorbs ultraviolet solar radiation; (5) supplies aerodynamic lift and drag; (6) supplies diffuse daylight; (7) absorbs meteors; and (8) interacts thermally with the craft. Above an altitude of 120 miles only three factors of terrestrial origin remain: (1) the shielding action of the earth against half the number of meteors and cosmic-ray particles; (2) the magnetic field of the earth which deflects cosmic-ray particles; and (3) the solar radiation reflected and the infrared radiation emitted by the earth.

Haber, H. 1952a
MEDICAL RESEARCH IN THE DEVELOPMENT OF MANNED ROCKET FLIGHT. — Tech. Data Digest (U. S., Central Air Documents Office), 17 (2): 12-13. 1952. DLC (Z5063.A2U65, v. 17)

A tentative schedule of present and future aviation- and space-medical research tasks is presented. The establishment of an artificial satellite would be the next step in line, with animal experiments preceding the employment of humans. Future studies will have to concentrate particularly on problems resulting from conditions in an environment without gravity and atmosphere (supply of climate and breathing air, filtering of radiation, and supply of mechanical support).

Haber, H. 1952b
CAN WE SURVIVE IN SPACE? — In: Across the space frontier, p. 71-97. Ed. by C. Ryan. New York: Viking Press, 1952.
DLC (TL790.R9)

A popular presentation of physiological and psychological problems arising in space travel from high acceleration, lack of atmosphere, from cosmic and solar radiations, lack of gravitational forces, and from hazards like meteorites and inadequate temperature regulation.

[Haber, H.] 1952c
PROBLEMS OF SPACE TRAVEL. — Sci. News Letter, 62 (12): 180. 1952.
DLC (Q1.S76, v. 62)

An analysis of psychological, physiological, and physical problems of space travel, presented by the author in an address before the American Society of Mechanical Engineers, is summarized. Meteors constitute a danger above 90 miles; cosmic rays are a health hazard between 13 and 23 miles; and ozone and ultraviolet light require protective measures. Frictional heat and extreme temperature differentials between lighted and shaded parts of the rocket represent an additional problem. Weightlessness in free space merely creates slight physiological disturbances; little is known, however, about the psychological consequences of subgravitational flight.

Haber, H. 1952d
[MAN IN SPACE] Der Mensch im Weltall. — Weltraumfahrt (Frankfurt), 1952 (1): 13-16. 1952. In German.
DLC (TL789.W45, 1952)

Space medicine cannot be considered merely a matter of the future. Human flight has reached heights which, for all practical purposes, approximate conditions of interplanetary space. The paper summarizes briefly and in general terms problems of temperature regulation in the space ship, the dangers of cosmic radiation, and neuromuscular difficulties arising from the lack of gravitational pull.

Haber, H. 1952e
GRAVITY, INERTIA, AND WEIGHT. — In: Physics and medicine of the upper atmosphere: a study of the aeropause, p. 123-136. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico Press, 1952.
DLC (RC1050.U5, 1952)

To evaluate properly the physiological processes in flight, a new formulation of the concept of weight is required. In reversing and implementing the classical definition of weight (or the force of attraction which the earth exerts on a body, with its direction toward the center of the earth) the following definition is proposed: weight is the resultant external force exerted upon a body by a restraining agent in response to forces of gravitation and inertia. This definition makes it evident that weight of a body is not a constant nor a property of the body but depends upon the dynamic conditions to which the body is subjected (e.g. inertia, drag, or propulsion in an aircraft). On the basis of this definition a formula is developed to determine the weight of a pilot under all conditions of propelled and unpropelled flight. The possibility of prolonged weightlessness is a factor to be counted on in future flight and is going to become an outstanding aviation-medical problem. While no major disturbances in the normal physiological functions (such as digestion, breathing, etc.) are foreseen, normal orientation might be impaired.

Haber, H. 1952f
THE CONCEPT OF WEIGHT IN AVIATION. — Jour. Aviation Med., 23 (6): 594-596. 1952.
DLC (TL555.A1A4, v. 23)

For purposes of aviation engineering and medicine, the concept of weight is redefined. The principle of d'Alembert states that the sum of the force of gravity, the force of inertia, and the external forces acting upon a body is zero. The weight of the body is then the resultant external force exerted upon the body by a restraining agent in response to forces of gravity and inertia. Six dynamic situations are illustrated, in which the three forces are represented as vectors.

Haber, H. 1952g
PHASING AND CO-ORDINATION OF MEDICAL RESEARCH WITH TECHNICAL AND ENVIRONMENTAL DEVELOPMENT. — In: Physics and medicine in the upper atmosphere: a study of the aeropause, p. 575-581. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico Press, 1952. DLC (RC1050.U5, 1952)

The basic environmental changes resulting from human flight beyond the earth's atmosphere are briefly outlined. These changes will impose on space medicine the task to overcome the following basic problems: (1) the problem of explosive decompression, temperature control, and bottled air; (2) problems arising from ionizing radiation (cosmic rays) and meteors; and (3) problems arising from the occurrence of weightlessness. A projected phase schedule is presented in diagrammatic form.

Haber, H. 1952h
FLIGHT AT THE BORDERS OF SPACE. — Scient. American, 186 (2): 20-23. 1952.
DLC (T1.S5, v. 186)

A popular presentation of the physical and physiological boundaries of the upper atmosphere.

Haber, H. 1952i
CAN WE SURVIVE IN SPACE? — Collier's, 129 (12): 35, 65-67. March 22, 1952.
DLC (AP2.C65, v. 129)

Essentially the same as the paper, Haber, H., 1952b.

Haber, H. see also Buettner, K., 1952
Hage, G. see Wulfften Palthe, P. M. van, 1952a
Hagen, E. see Thorndike, R. L., 1952a

Hale, H. B. 1952
and J. E. Keator
COMPARISON OF EOSINOPHIL RESPONSES IN HUMAN SUBJECTS DURING FLIGHTS IN AIRCRAFT, DECOMPRESSION TO 40,000 FT., AND EXPOSURE TO COLD. — Federation Proceedings, 11 (1 I): 63. 1952. DSG

Eosinophil fall values (which are proportional to the degree of stress imposed during a test situation) were determined on a group of 100 medical officers. The average fall amounted to 8% per day under ordinary stress conditions. In a group of subjects flying in a C-47 type plane for 2 hours (30 minutes of which at 15,000 feet without supplemental oxygen) the eosinophil fall was 18%; in another group exposed to a simulated altitude of 40,000 feet, using oxygen equipment beyond 18,000 feet, the fall was 40%; and in a third group exposed to -40° F at ground level with a 5 m.p.h. wind (the subjects wearing standard Air Force intermediate closing assembly for cold protection), the fall amounted to 23%.

Hale, H. B. 1952a
ADRENALCORTICAL ACTIVITY ASSOCIATED WITH EXPOSURE TO LOW FREQUENCY SOUNDS. — Amer. Jour. Physiol., 171 (3): 732. 1952. DLC (QP1. A5, v. 171)

Eosinophil levels of workmen at an aircraft engine testing stand were measured and compared with those of workers at a less noisy engine assembly line. In subjects unaccustomed to either type of noise and exposed to the intense noise conditions, a pattern of change was observed suggestive of a mild degree of stress. No stress symptoms were observed in the less noisy surroundings. The pattern obtained in workers exposed to intense noise also suggests stress.

Rats exposed to pure tones (6000 to 50 cycles per second) for 30 to 60 minutes at sound levels of 120 and 140 decibels showed an increase in the ascorbic acid content of the adrenals in the range of 400-50 c. p. s. (120 db.), but not at 3000 c. p. s. The response could be intensified by increasing the intensity to 140 db. Different strains of rats vary in responsiveness.

Hall, A. L. 1952
DETERMINATION OF OPTIMUM TIME INTERVAL BETWEEN OXYGEN SYSTEM FAILURE AND WARNING. — Naval School of Aviation Medicine, Pensacola, Fla. Feb. 15, 1952. 3+2 p. (Memorandum report TED no. PEN AE 510990; TIP U22226). UNCLASSIFIED

A study was conducted to determine the maximum time interval between failure of the oxygen system of an airplane and the first definite objective symptoms of physical deterioration in an occupant of the airplane. Using the Coleman anoxia photometer, time lapses were measured on 18 male subjects at sea level and at simulated altitudes of 20,000, 35,000, and 43,000 feet. First indications of decreased blood oxygen saturation were observed after time lapses of 91.2, 31.6, 16.2, and 9 seconds respectively. It is concluded that an oxygen-failure warning device operating within 9 seconds would be satisfactory up to an altitude of 43,000 feet.

Hall, A. L. 1952a
THE EFFECTS OF DECOMPRESSION ON SUBJECTS REPEATEDLY EXPOSED TO 32,000 FEET WHILE USING STANDARD PRESSURE BREATHING EQUIPMENT: INVOLUNTARY HYPERVENTILATION DURING PRESSURE BREATHING AT 43,000 FEET. — Naval School of Aviation Medicine, Pensacola, Fla. Feb. 20, 1952. 5+3 p. (Project report no. NM 001 059.21.01; TIP U22288). UNCLASSIFIED

The incidence of involuntary hyperventilation was determined for 36 healthy young seamen breathing oxygen under 10 inches of water pressure at a simulated 43,000-ft. altitude for 0.5 hr./day for 20 consecutive work days. Continuous anoxia photometer readings, X-rays, electrocardiograms, and speech-intelligibility tests were made. A total of 43 cases of hyperventilation occurred during 695 man-exposures (240.7 man hours). Hyperventilation was not observed during speech tests and was noted in only one shouting test. Subjects exhibited distended abdomens and 148 incidents of gas pain. The similarity of the early subjective symptoms of hyperventilation and hypoxia is discussed. (TIP abstract)

Hall, A. L. 1952b
and M. M. Shrinagesh
THE EFFECTS OF DECOMPRESSION ON SUBJECTS REPEATEDLY EXPOSED TO 43,000 FEET WHILE USING STANDARD PRESSURE BREATHING EQUIPMENT. — Naval School of Aviation Medicine, Pensacola, Fla. April 25, 1952. 5+16 p. (Project report no. NM 001 059.21.02; AD 1015). UNCLASSIFIED

Thirty-six young, male, volunteer seamen were exposed to a simulated altitude of 43,000 ft. for 1/2 hour per day for 20 consecutive work days. Arterial blood oxygen saturation was measured for each subject; electrocardiograms were taken at sea level and 43,000 ft.; and chest X-rays were taken of one subject at sea level and 43,000 ft. during each run. The subjects breathed oxygen for one-half hour before ascent; at 43,000 ft. they breathed O_2 at a pressure of 10 in. H_2O from individual, preweighed cylinders. Of 695 half-hour man-exposures attempted, men were brought down prematurely on 126 occasions because of intestinal gas pain, aeroembolism, hypoxia, hyperventilation, nausea, epistaxis, and mechanical failures. Mean blood O_2 saturation (exclusive of speaking, shouting, and X-rays) was 84.26%. Speaking for one minute against 10-in. H_2O pressure increased blood O_2 saturation an average of 5.14%. Oxygen expenditures at 43,000 ft. averaged 7.46 liters per minute STPD (standard temperature and pressure and dry). (TIP abstract)

Hall, A. L., 1952c
M. M. Shrinagesh, and M. N. Johnson
THE EFFECTS OF DECOMPRESSION ON SUB-

JECTS REPEATEDLY EXPOSED TO 43,000 FEET WHILE USING STANDARD PRESSURE BREATHING EQUIPMENT: INCIDENCE OF AEROEMBOLISM IN AN INDIVIDUAL SUBJECTED TO 82 EXPOSURES, A CASE REPORT. — Naval School of Aviation Medicine, Pensacola, Fla. July 15, 1952. 3+2 p. (Project report no. NM 001 059.21.03; TIP U24238). UNCLASSIFIED

During a period of less than 6 months a young man was exposed to a simulated altitude of 43,000 ft. 1/2 hour per day for 82 exposures. The subject experienced one mild incident of skin aeroembolism and one severe incident of joint aeroembolism during the first 75 runs. Aeroembolism symptoms increased in number and severity until hemianopsia developed at the end of the 82nd run. Apparently the subject's initial high resistance was slowly lowered by repeated exposures to low barometric pressures. Aging played little or no part in the increased susceptibility. (TIP abstract)

Hall, A. L. 1952d
USE OF STANDARD NAVAL AVIATION OXYGEN EQUIPMENT UNDER WATER. — Naval School of Aviation Medicine, Pensacola, Fla. July 15, 1952. 2+2 p. (Project report no. NM 001 059.29.01; TIP U24638). UNCLASSIFIED

Various types of Naval Aviation oxygen equipment were taken underwater to a maximum depth of 65 feet by human subjects. All combinations of oxygen equipment operated satisfactorily under water except the H-2 bail-out oxygen cylinder. The 514-cu. in. oxygen cylinder furnished adequate oxygen for an average duration of 31 minutes at a depth of 33 feet.

Possible implications are made for aircrewmen making forced landings on the water who are unable to abandon the airplane before it sinks. (Naval School of Aviation Medicine abstract)

Hall, F. G., 1952
J. W. Black, K. K. Neely, and K. Hall
THE INFLUENCE OF LOUD SPEAKING ON PULMONARY GAS EXCHANGE. — Jour. Aviation Med., 23 (3): 211-215. 1952.
DLC (TL555.A1A4, v. 23)

The effect of loud speaking on the composition of the pulmonary alveolar air was studied in 10 male subjects who read a text for 1 to 15 minutes at a sound level of 90-92 decibels. "The outcome of this study can be stated quite simply: loud speaking involves hyperventilation. During the period of hyperventilation, CO_2 is washed out of the lungs. Subsequent to the loud talking there is a period of reduced respiration during which the re-establishment of the normal gaseous balance begins. This balance is not regained within six minutes." (Authors' conclusion.)

Hall, F. G. 1952a
REGULATION OF BREATHING OF MAN AT ALTITUDE. — Federation Proceedings, 11 (1 1): 63. 1952. DSG

Hypoxia and hypercapnia are separate but additive factors towards stimulation of pulmonary ventilation at high altitudes. The actual regulation of respiration at high altitudes is, however, determined by the manner in which these two factors interact with each other.

Hall, K. see Hall, F. G., 1952
Halliday, R. C. see Gordon, M. A., 1952

Halsey, R. M. 1952
and A. Chapanis
AN EXPERIMENTAL DETERMINATION OF SOME ISO-CHROMATICITY LINES IN COLOR-DEFICIENT VISION. — Jour. Optical Soc., 42 (10): 722-739. 1952. DLC (QC350.O6, v. 42)
Reprint issued also as: Johns Hopkins Univ., Baltimore, Md. (Contract N5ori-166, Task order 1); issued by Office of Naval Research, Naval Research Lab., Washington, D. C., JHU Report no. 166-I-147 (Project no. NR 784-001) (AD 259). UNCLASSIFIED

This is an experimental study of color matching carried out by protanoptic and deuteranoptic individuals against normal control subjects. A diagramatic method of evaluating the results is described.

Hammond, D. see Rahn, H., 1952

Handford, S. W., 1952
T. E. Cone, and S. C. Gover
A SHIP'S MOTION AND THE INCIDENCE OF SEASICKNESS. — Naval Medical Field Research Lab., Camp Lejeune, N. C. (vol. 3: 269-298). Nov. 1952. (Project no. NM 005 052.31; AD 1016). UNCLASSIFIED

A P-2 class transport vessel was equipped with electronic recording devices to record the pitch, roll, and heave for about 2½ days. Data on the incidence of seasickness among the 638 men aboard were collected at ½-hr. intervals. During the very smooth crossing, 35.5% of the men became sick. Sickness was most prevalent at reveille. No significant correlations were obtained.

Handford, S. W. see also Chinn, H. I., 1952a, 1952b, 1952f
Hanna, C. H. see Marshall, L. H., 1952

Hansen, R. G. 1952
EFFECT OF JAW RESTRICTION ON SPEECH INTELLIGIBILITY. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-223, Sept. 1952. iii+26 p. (RDO no. 695-63; AD 6899). UNCLASSIFIED

Twenty-four speakers each read a list of 24 words to groups of 8 to 10 listeners under varying conditions of voice level (70, 80, or 90 db.) and jaw restriction (no restriction to complete restriction). An analysis of the listener scores indicated that the jaw restriction and loudness

levels did not significantly affect speech intelligibility. A training program for flight personnel is recommended to minimize the differences which occurred for individual listeners (standard deviation of 2.66) and between speakers (1.89). (AD abstract)

Hansen, R. G. see also Gierke, H. E. von, 1952a
Hanson, J. A. see Crook, M. N., 1952
Hardie, J. B. see Sellers, A. H., 1952

Harding, F. D. 1952
and W. F. Long
DEVELOPMENT OF A FORCED-CHOICE RATING SCALE FOR EVALUATION OF CLASSROOM INSTRUCTORS. — Air Training Command. Human Resources Research Center. Aircraft Observer Training Research Lab., Lackland Air Force Base, Tex. Research bulletin no. 52-21, June 1952. iv+10 p. (Project no. 506-006-0001; TIP U24228). PB 107535

Favorably worded statements descriptive of instructor performance were compiled from various sources, and categorized into 7 areas of instructor performance. A total of 232 students and 50 instructors evaluated 179 statements in terms of the best or the poorest military classroom instructor they had known. Based upon the descriptiveness scale values obtained in the analysis of the qualification check list data, preference and discrimination indexes pertinent to forced-choice item construction were calculated. Indexes based upon student responses were used in the construction of items; the samples were not combined because of the difference in obtained means. Each tetrad was constructed to include two statements having high discrimination indexes and two having low indexes, all four having similar preference indexes. Using this type of question, Instructor Description Reports were tested and revised. The validity and reliability statistics for these forms, based upon mean and median descriptiveness scale values, were found to be sufficiently similar so that no advantage could be attributed to the use of either measure apart from ease of calculation. (TIP abstract)

Harker, G. S. 1952
THE STEREOPTOMETER—AN INSTRUMENT FOR THE STUDY OF BINOCULAR VISION. — Army Medical Research Lab., Fort Knox, Ky. Report no. 106, Dec. 2, 1952. i+9 p. (Project no. 6-95-20-001, Subtask AMRL S-2; AD 2792). UNCLASSIFIED

The stereoptometer was developed to incorporate the psychovisual task of the stereoscopic range finder into a device amenable to laboratory manipulation. The instrument was intended for use in the study of factors pertaining to the individual, the range finder, and the target field as they affect stereoscopic-range-finder performance. A preliminary model of the stereoptometer provided asymmetrical convergence of the right element only and a sensitivity of 20 seconds of arc per division. A modified version provided a choice of symmetrical or asymmetrical left or right convergence and a sensitivity of 4 seconds of arc per division. (AD abstract)

Harker, G. S. see also Alluisi, E. A., 1952, 1952a

Harris, J. D. 1952
AN HISTORICAL AND CRITICAL REVIEW OF LOUDNESS RECRUITMENT. — Naval Medical Research Lab., New London, Conn. Report no. 200 (vol. 11, no. 17), May 20, 1952. 47 p. (Project no. NM 003 041.21.07; TIP U25399). UNCLASSIFIED

Some partially-deaf ears are paradoxically much more sensitive to the loudness of sounds than normal-hearing ears. As the physical energy of a sound is increased from the point at which it can just barely be heard, the sound quickly leaps into consciousness and accelerates in dramatic fashion. A sound only 15 decibels above threshold in such an ear may seem as loud as a sound 60 decibels above threshold in a normal ear. This is the so-called "recruitment" phenomenon. The paper presents a comprehensive review of the literature on the subject. A total of 13 methods are summarized of determining recruitment, its clinical significance, its rate and type, some theoretical explanations, and certain analogies in the normal ear. Attached are 122 references, including 73 from foreign sources.

Harris, J. D. 1952a
PITCH DISCRIMINATION. — Naval Medical Research Lab., New London, Conn. Report no. 205 (vol. 11, no. 22), June 1952. 22 p. (Project report no. NM 003 041.22.04; TIP U25400). UNCLASSIFIED

A new determination of the difference limen (DL) of pitch perception was made at 125, 250, 500, 1000, 2000 and 4000 c.p.s., at sound intensities of 5 to 30 db. above threshold, and at 60 c.p.s., 5 to 15 db. above threshold. Three well-trained subjects were used in a forced-judgment variant of the method of constant stimulus differences. The decreases in pitch sensitivity with loudness are presented graphically. The relationship between sensitivity and loudness was almost constant over the frequency range studied, and the absolute DL continued to decrease with the frequency, especially at the lower loudness levels. The data of Shower and Biddulph (Jour. Acoust. Soc. Amer., 3: 275-287, 1931), which are derived from sinusoidal frequency modulation, bear little relation to other data below 1000 c,p c.p.s. The frequency-modulation technique may be an experiment in some type of beats or masking. (TIP abstract)

Harris, J. D. 1952b
THE DECLINE OF PITCH DISCRIMINATION WITH TIME. — Jour. Exper. Psychol., 43 (2): 96-99. 1952. DLC (BF1.J6, v. 43)

The effect of the time elapsed between two pure-tone stimuli on pitch discrimination was studied. A 40-item series was given to each sub-

ject for practice purposes and those who scored 11 or more items incorrectly were excluded from further testing. The standard stimulus at 1000 c. p. s. was given first and each comparison stimulus was based on 36 judgments. A group of 32 subjects was tested with a fixed standard stimulus and no decline in pitch discrimination occurred up to 3.5 seconds, a decline of 0.8 c. p. s. was noted after 15 sec., and of 3.0 c.p.s. after 25 sec. When 12 subjects were exposed to a "roving" standard stimulus, no decline was noted from 0.1 to 1.0 sec., but delays of 3, 7, and 15 seconds induced changes of 0.85, 1.1, and 3.7 c. p. s., respectively.

Harris, J. D. see also Rawnsley, A. I., 1952, 1952a; Wing, K. G., 1952

Harrold, M. C. 1952
ROCKET FIRE PROTECTION. — May 1952. 13+247 p. Aerojet Engineering Corp., Azusa, Calif. (Contract AF 33(038)-11975); issued by Wright Air Development Center. Equipment Lab., Wright-Patterson Air Force Base, Ohio. AF Technical report no.5876 (AD 10 905).
PB 115497

The report covers preliminary investigations of rocket fire hazards in piloted aircraft and possible measures for the prevention and extinguishment of fires primarily involving white fuming nitric acid and JP-3. Propellant fire hazards, the performance of warning devices, and the effectiveness of water and four halogenated hydrocarbons as extinguishing agents, were studied experimentally by means of fires from propellant sprays in a compartment of a simulated rocket engine. The spontaneous-ignition temperatures of rocket fuels and extinguishing agents were determined in various oxidizing atmospheres, using a specially constructed, hot metal bath. It was determined that it is feasible to protect rocket aircraft from fire and explosion hazards involving white fuming nitric acid and JP-3 by cutting off propellant flows, and by discharging chemical extinguishing agents at high rates. Bromotrifluoromethane and dibromodifluoromethane reliably extinguished propellant fires; none of the other agents tested was completely effective. (Author's abstract)

[Hasbrook, A. H.] 1952
CRASH INJURY STUDY OF THE NORTHEAST AIRLINES-CONVAIR 240 ACCIDENT AT LA GUARDIA AIRPORT ON JANUARY 14, 1952. 36 p. Cornell Univ. Medical College. Department of Public Health and Preventive Medicine. Informative Accident Release no. 14, Aug. 1952.
DSG (W1. CR121)

Analysis of an accident involving a Northeast Airlines Convair 240 in Flushing Bay near La Guardia Airport on January 14, 1952, revealed the following facts: (1) the hull and the passenger cabin were exposed to localized peak forces of over 6 g; (2) all passengers were seated in forward-facing seats designed to resist forward loads up to 6 g; (3) 10 of the 20 seats sustained anchorage failure (7 seat frames were extensively damaged and 10 seat backs deformed); (4) the C-22a "3,000 lb" safety belts remained intact; and (5) although some passengers struck and dented seat backs, no dangerous injuries resulted from the impacts. It is recommended that a strong cable or ductile wire linkage be used to carry safety belt loads directly to the hull structures, bypassing the seats. The safety advantage of light, ductile, well-padded, "de-lethalized" seat-back structures is emphasized.

Hasbrook, A. H. see also DeHaven, H., 1952b
Hauer, P. see Maurath, J., 1952

Hebraud, A. 1952
[STRETCHER FOR TRANSPORTATION OF PATIENTS WITH SERIOUS INJURIES] Gouttière pour le transport des grands blessés. — Médecin d'usine (Paris), 14 (9): 491-494. 1952. In French.
DSG (W1 ME1184, v. 14)

The author discusses the construction of stretchers to be used by the French Navy in cases of multiple fracture, fracture of the spinal column, or grave burns. These sled-shaped metal stretchers weigh about 9 kg. and are easily carried by two men or pushed by one person like a wheelbarrow (there are two wheels at the lower end of the stretcher). The wounded is strapped to the stretcher so that he is completely safe even if lifted vertically.

Hemingway, A. 1952
and G. G. Nahas
EFFECT OF VARYING DEGREES OF HYPOXIA ON TEMPERATURE REGULATION. — Amer. Jour. Physiol., 170 (2): 426-433. 1952.
DLC (QP1. A5, v. 170)

Dogs were exposed to inhalation of mixtures containing 16, 12, 8, or 6 per cent oxygen, alternating with inhalations of normal air at a constant room temperature of 23°C. Rectal temperatures fell below normal during the hypoxic stages (from 38. 25°C to 37.65°C at 6% oxygen). When normal air breathing was resumed, the rectal temperature rose abruptly. The experiments revealed the following additional data: (1) the oxygen consumption rate dropped sharply during the initial phase of hypoxic breathing, but rose again and, after one hour, exceeded the normal-air values; (2) and the respiratory quotient rose sharply during the first 8 minutes of hypoxic inhalation, then gradually dropped to pre-hypoxic values. It is concluded that mild degrees of hypoxia impair the physiological temperature regulation in a cold environment.

Hemingway, A. 1952a
and G. G. Nahas
EFFECT OF HYPOXIA ON THE METABOLIC RESPONSE TO COLD. — Jour. Applied Physiol., 5 (6): 267-272. 1952. DLC (QP1. J72, v. 5)

Unanesthetized dogs were exposed to breathing of air or of 16, 12, and 8% oxygen in nitrogen, at ambient temperatures of 24°C. and 12°C., re-

spectively. The expired gas was collected in 5-minute stages during the prehypoxic period, during the hypoxic period (of 1 hour), and 20 minutes after breathing of normal air had been resumed. Metabolic measurements revealed (1) a decrease of the oxygen consumption rate at the onset of the hypoxic period, followed by a slow rise to above-prehypoxic values; (2) a rise of the respiratory quotient during the first 5 minutes of the hypoxic period and later a slow decrease, with peak values lower in the cold than in the warm environment (however, when 8% oxygen was inhaled at 12°C., the respiratory quotient remained constant); (3) increase of minute volume of respiration, proportional to the degree of hypoxia and to the lowering of ambient temperatures; (4) a decline in rectal temperatures with progressing hypoxia in both warm and cold envionments (when 12% oxygen was breathed, the rectal temperature fell almost 0.50°C. more in the warm than in the cold environment).

Hemingway, A. 1952b
PULMONARY EDEMA IN GUINEA PIGS DURING SEVERE HYPOXIA. — Jour. Applied Physiol., 4 (11): 868-872. 1952.
DLC (QP1.J72, v. 11)

Guinea pigs of similar weight and appearance were divided into pairs (one of each pair serving as control) and kept for three weeks in cages in the same laboratory environment and on the same diet. The experimental animals were exposed to atmospheres of progressively decreasing oxygen pressure (7%, 5%, 3%, and finally 2%), until gasping movements set in (and before any cardiac irregularity was observed). Then both the experimental animal and the control were decapitated and their lungs were removed and analyzed. There was no significant difference observed between the hypoxic and the control animals in lung weight, insoluble protein nitrogen, soluble (non-Hb) protein nitrogen (soluble in 1% NaCl), and pulmonary hemoglobin. Hypoxia did not induce severe pulmonary edema under the conditions of the experiment.

Hempel, W. E. see Zachert, V., 1952b

Hemphill, J. K. 1952
AIR CREW COMPOSITION RESEARCH. — Eng. Exper. Station News, Ohio State Univ., 24 (5): 21-23. 1952. DLC (TA401.O5, v. 24)

A critical study of performance data of about 400 B-29 and B-50 bomber crew members was undertaken by the Personnel Research Board of the Ohio State University (from 1950 to 1952) in an attempt to improve personnel procedures for the selection, assembly, and training of combat air crews. The observations centered on the following criteria: bombing accuracy, ratings by peers, subordinates, and supervisory personnel, and flight data; shared knowledge of special duties among crew members; degree of compatibility among the members assigned to a crew; and commander behavior. — The following other subprojects of this research program are listed: changes in crew characteristics occurring during crew training; the effects of different status arrangements within the crews on crew performance; identifying the characteristics of effective co-operation among crew members ("crew coordination"); the preparation of case studies of notably effective versus ineffective crews; and changes in crews resulting from subjection to high-stress situations.

Hemphill, J. K. 1952a
C. H. Rush, and others
STUDIES IN AIRCREW COMPOSITION. I. MEASUREMENT OF CROSS TRAINING IN B-29 AIRCREWS. — May 1952. 30 p. Ohio State Univ. Personnel Research Board, Columbus (Contracts AF 33(038)-10105 and AF 18(600)-67); issued by Human Resources Research Labs., Bolling Air Force Base, D. C. HRRL Memo report no. 23. (TIP U24391). PB 113160

The B-29 Cross Training Examination Form 1 was administered to 364 air crew members attending a combat crew training school. The examination consisted of 7 short subtests, one for each of the specialties of B-29 crews. The test exhibited serious limitations, presumably attributable to the short length of the subtests (8 to 10 items). The reliability of the total test scores for all crew members was estimated to be 0.60. The patterning of the knowledge possessed by the various specialists corresponded to the officially designated functional subteams of a B-29 aircrew. A crew index of overlap of knowledge or information based on the frequency with which correct information was shared by the members of the same crew was related to theeffectiveness of crew coordination as judged by the crew training. Correlations between the crew index of overlap and measures of radar and visual bombing proficiency were 0.31 and 0.01, respectively. Several significant relationships were found between total scores and proficiency and motivation in cambat as well as over-all combat effectiveness (From TIP abstract)

Hemphill, J. K. 1952b
and L. B. Sechrest
A COMPARISON OF THREE CRITERIA OF AIRCREW EFFECTIVENESS IN COMBAT OVER KOREA. — Jour. Applied Psychol., 36 (5): 323-327. 1952. DSG

The interrelationships of certain performance criteria (ratings by superiors, attitude towards crew members expressed in "sociomatic nominations", and bombing accuracy records) were studied in 94 B-29 aircrews. A substantial correlation was observed between objective bombing accuracy data and ratings by superiors; this correlation may be attributable to "contamination of judgment" by widely publicized results of bombing missions. The sociometric index of "on-crew choice" does not reveal any marked relation to ratings by superiors.

Hendler, E. 1952
DESCRIPTION OF THE HG-1 CATAPULT. — Naval Air Experimental Station. Aeronautical Medical Equipment Lab., Philadelphia, Pa. [1952]. 4 p. [Paper presented at Conference on Problems of Emergency Escape in High Speed Flight, 29-30 Sep. 1952, at Wright-Patterson Air Force Base, Ohio]. (AD 14 359). UNCLASSIFIED

The HG-1 catapult designed by the Naval Aircraft Factory and used by the Aeronautical Medical Equipment Laboratory at Philadelphia, Pa., for the study of acceleration and deceleration effects on living organisms, is described. The HG-1 is a pneumatically energized, hydraulically controlled mechanism propelling a test car which slides upon rails until stopped by the arresting cable. It is capable of applying an accelerative force of 30 g to a load of 3,000 lbs. Instruments recording speed and acceleration are mounted on the car, and photocells transmit signals whenever portions of the car pass specific positions.

Hennessy, T. G. see Lawrence, J. H., 1952

Henry, J. P., 1952
E. R. Ballinger, P. J. Maher, and D. G. Simons
ANIMAL STUDIES OF THE SUBGRAVITY STATE DURING ROCKET FLIGHT. — Jour. Aviation Med., 23 (3): 421-432. 1952. DLC (TL555.A1A4, v. 23)

Two studies were conducted with rockets (V-2 and Aerobee) to obtain information on the physiological reactions in states of subgravity and zero gravity. In the first study, pulse, respiration, electrocardiogram, and arterial and venous pressures were telemetered from one or more of the 7 anesthetized monkeys (several species). Apart from a slow fall of the systolic and diastolic arterial pressures during the phase of subgravity, neither marked cardiac nor respiratory disturbances were apparent. In the second type of study mice were observed by direct photography for 2-3 minutes in a state of subgravity in various circumstances. Some of the mice had their labyrinth cauterized. As long as any foothold was available to normal animals, they did not seem to be disturbed; when both tactile and visual points of reference were denied, signs of gravity stress became apparent. Normal activity was resumed by all of them immediately following reappearance of an orienting gravity stress. This proves that in 2-3 minutes the subgravity state will not lead to any serious psychophysiological difficulties.

Henry, J. P. 1952a
PROBLEMS OF ESCAPE DURING FLIGHT ABOVE 50,000 FEET. — In: Physics and medicine of the upper atmosphere: a study of the aeropause, p. 516-532. Ed. by Clayton S. White et al. Albuquerque, University of New Mexico Press, 1952. DLC (RC1050.U5, 1952)

Physiological problems arising from cabin pressure failure at high altitudes are discussed. On the basis of present findings, no deleterious effect from cosmic radiation may be expected even at prolonged flying (25 hours a week) up to altitudes of 60,000 feet. Below this altitude, normal oxygenation can be sustained with the aid of a special helmet and an elastic vest protecting the trunk. Elastic resistance of the vest may be overcome by the use of an intermittent breathing valve. However, even with this device, pressure breathing can only be maintained for a few minutes before unconsciousness sets in because of the pooling of blood in the extended limb veins. The adoption of a full pressure suit would overcome most of the difficulties encountered in the helmet and vest protection method. Unfortunately, however, such suits, at the present stage of development, are extremely cumbersome to wear, and the problem of internal ventilation has not yet been entirely solved.

[Henry, J. P.] 1952b
MEN FROM EARTH. — Honeywell Flight Lines, 3 (6): 6-7. 1952. DLC (TL724.5.M54A43, v. 3)

The T-1 high-altitude pressure suit, developed by the Research and Development Command of the U. S. Air Force, is described. Work on it was begun in 1943 at the University of California under the direction of Dr. J. P. Henry. The T-1 pressure suit is tubed along the arms and legs and inflates automatically when cabin pressurization is lost. Its one-piece helmet includes an electrically heated face piece (to avoid frosting), respiratory valves, a microphone, and earphones. An oxygen breathing hose at the front of the helmet is connected to the aircraft's oxygen system and to an emergency oxygen bottle strapped to the pilot's leg. Field tests at altitudes up to 80,000 feet have shown the usefulness of the suit.

Hermann, F. von 1952
PRONE FLYING. — Sailplane and Glider (London), 20 (6): 5-6. 1952. DLC (TL760.A1S3, v. 20)

Reports of various German pilots regarding their personal experience while piloting a plane in the prone position, reveal that in no case major discomfort was encountered. A position between kneeling and lying prone, with the upper part of the body inclined at 30° to the horizontal proved to be the best posture. No fatigue was experienced even after flights lasting 6 to 10 hours. The range of vision was found to be considerably wider than in the sitting position. Only one pilot stated that the location of the head far in front of the center of gravity of the aircraft, involved angular accelerations which were felt unplaseantly in acrobatic flying.

Hernando, O. J. 1952
[BIOLOGY OF ALTITUDE: STUDIES ON INHABITANTS OF BOGOTA (2,640 m. ALTITUDE)] Biología de altura: estudios sobre residentes en Bogotá (2,640 m. de altura). — Anales de la facultad de medicina, Universidad nacional mayor de San Marcos de Lima (Lima, Peru), 35 (1): 70-110. 1952. In Spanish. DSG

Studies on the physiology and pathology of the residents of Bogota (elevation 2,640 m.) are reviewed, with special regard to the cardiovascular, respiratory, and nervous systems. The following conclusions are reached: (1) the oxygen saturation in the blood is almost normal; (2) pulse and blood pressure are normal and the electrocardiogram does not reveal symptoms of anoxia; (3) metabolism, respiration, and neuromuscular reactions are normal; (4) symptoms of mountain sickness have been observed only in exceptional cases; (5) a wide-spread incidence of melanosis was observed, a fact that is, however, attributed to alimentary deficiencies rather than to high-altitude factors; and (6) there is still a great need for special studies on the influence of high altitude on cardiac and pulmonic diseases.

Herrick, R. M., 1952
A. L. Diamond, and M. P. Kuhns
LUMINANCE THRESHOLDS DURING DARK ADAPTATION FOLLOWING PREADAPTATION TO CATHODE RAY TUBE DISPLAYS. — Dec. 1952. iv+11 p. Columbia Univ., New York (Contract AF 33(038)-22616); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-260 (RDO no. 694-45) (AD 18 118). PB 112218

With the identification of the position of a luminous dial pointer as the threshold criterion, luminance thresholds were determined at various times during dark adaptation following preadaptation to Cathode Ray Tube displays. Each display consisted of a vertical trace line which traversed the Cathode Ray Tube screen at one of three rates. Dark adaptation curves obtained after adaptation to the different displays are superimposed; initial thresholds are relatively low (-2.0 log millilamberts); and dark adaptation is essentially complete in five minutes. The findings are interpreted to indicate that in certain Air Force applications, viewing such displays causes a definite temporary loss in the observer's ability to read instrument dials and to perceive objects external to the aircraft. (Authors' abstract)

Hertzka, A. F. see Guilford, J. P., 1952
Hertzman, A. B. see Higginbotham, A. C., 1952; Peiss, C. N., 1952
Hervey, G. R. see Glaser, E. M., 1952

[Hester, W. R.] 1952
STUDY OF PLASTIC TEETH. — Military Surgeon, 110 (2): 151. 1952.
DLC (RD1.A7, v. 110)

Plastic fillings, first developed by the Germans at the end of World War II, have been tried out by the U. S. Air Force for several years. The resistance of these fillings against special conditions encountered in flight, such as high altitudes, temperature variations, humidity, and other climatic factors, is being tested at present.

Heyl, E. B. 1952
RESPECT WEATHER — WHEN YOU CAN'T SEE, LOOK OUT! A STUDY OF FATAL ACCIDENTS OCCURRING IN 1950 DURING WEATHER IN WHICH CEILING AND VISIBILITY WERE BELOW THE MINIMUMS REQUIRED FOR OPERATION UNDER VISUAL FLIGHT RULES. — Civil Aeronautics Board. Bureau of Safety Investigation, Washington, D. C. Feb. 1952. 4 p. DCAB

A survey was undertaken by the Medical Division of the Civil Aeronautics Administration to determine the various age and experience levels of a sample group of certified pilots and to correlate the results with accident rates. The very high accident occurrence found in the 50-59-year age group is attributed to inadequate adjustment to bad-weather instrumentation in newer-type planes. Statistical tables summarizing fatal accidents by type, and presenting a brakedown by age, experience, and types of airplane, are included.

Higginbotham, A. C., 1952
H. E. Ederstrom, and A. B. Hertzman
CUTANEOUS TEMPERATURE GRADIENTS, HEAT LOSSES AND BLOOD FLOWS IN THE DOG'S FOOT-PAD: THE NINTH OF A SERIES OF REPORTS ON STUDIES ON CUTANEOUS HEAT LOSSES. Dec. 1952. iii+11 p. St. Louis Univ. School of Medicine, Mo. (Contract no. AF 18(600)-96); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. AF Technical report no. 6680 (RDO no. 696-69) (AD 5223).
UNCLASSIFIED

The application of the Fick principle to the calculation of cutaneous blood flow from estimations of surface heat losses and measurements of tissue temperatures was examined in the dog's footpad. Tissue temperatures were measured precisely by thermocouples. Temperature gradients were estimated closely by exactly determining the depth of the thermocouples with a radiographic technique. Heat losses at the surface as estimated by the method of partitional calorimetry were compared with the calculated heat transfer across the superficial tissues. The two heat transfers agreed moderately well when surface and tissue temperatures and thermocouple depth were recorded accurately. Blood flows in the footpad as calculated from the thermal data were compared with recordings of the superficial dermal pulses with a photoelectric plethysmograph. The quantitative correlation of these two items varied with the degree of vasomotor tone although the directional changes indicated by the two criteria of vascular response agreed qualitatively. It was concluded that in the dog's footpad the conductance and skin pulse methods of estimating blood flow did not measure the responses of the same blod vessels. (From the authors' abstract)

Highman, B. see Altland, P. D., 1952

Hill, J. C., 1952
J. D. Chatham, and H. C. Dyme
FOIL PACK IN-FLIGHT FEEDING SYSTEM. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. Technical memorandum report WCRD 52-21. May 1, 1952. 52 p. (RDO no. 696-80; TIP U25306). UNCLASSIFIED

A system for USAF in-flight feeding is described which includes 68 recipes and menus for 11 meals, and the recommended equipment, procedures, and techniques. Fresh foods are prepared uncooked, sealed in aluminum foil packs, and refrigerated in trays which combine them into meals. Rolls, cakes, pies, and meat require precooking. Meals are cooked for 30 min. in a B-4 electrically heated oven to which heat is supplied by resistance elements secured to the bottom of each tray. The sectional C-1 refrigerator can accommodate 34, 62, or 90 prepacked meals. The meals are deficient in calcium and riboflavin. Recommendations are made for a supplementary feeding method for preparation of cheese sandwiches and eggs, and for an accessory packet to include eating utensils, salt, pepper, sugar, soluble milk, and coffee. Appendixes include recommended menus and recipes, and list the nutritional data for the foil-pack meals. (TIP abstract)

Hill, J. H., 1952
E. P. Buckley, and H. J. Older
POST-TRAINING PERFORMANCE OF AVIATION MACHINIST'S MATES. — Institute for Research in Human Relations, Philadelphia, Pa. Series 1952, Report no. 5, May 1952. 36+[64] p. (Contract N8onr-69402; TIP U22579). PB 107038

Procedures were developed for evaluating the post-training performance of naval aviation machinist's mates (AD's). An AD job sample test was developed in which scores are derived from careful observation and rating of actual performance of selected maintenance jobs on aircraft; reliability was adequate, and the test was well accepted by responsible maintenance personnel as a relevant measure of maintenance skill. An AD paper-and-pencil post-training evaluation test was also developed which was highly related to the AD sample test, possessed the advantage of ease of administration, and had adequate reliability and other desirable qualities. Suggested uses for the two proficiency measures include the evaluation of training program effectiveness, assessment of the proficiency level in research on the development of selection and classification test. Subsidiary objectives accomplished include the development of methods for assessing certain attitudinal aspects of aviation machinist's mate performance and the examination of the adequacy of a battery of existing tests to predict the criteria developed. Correlations of some of the tests of the Navy Basic Battery and the AD scale of the Vocational Interest Inventory with the criteria were not sufficiently high to permit practical prediction of the post-training performance of aviation machinist's mates. (From TIP abstract)

Hill, J. H., 1952a
H. J. Older, and W. C. Schaefer
AN ANALYSIS OF MAINTENANCE DUTIES ON JET PROPELLED NAVAL AIRCRAFT. — Institute for Research in Human Relations, Philadelphia, Pa. Series 1952, Report no. 6, May 1952. iv+94+9+59 p.; and Technical appendix, 63 p. (Contract N8onr-69406; TIP U22826). PB 107147

Data were gathered concerning personnel qualifications for the activities involved in the maintenance of jet-propelled aircraft. A questionnaire was administered to 333 maintenance personnel of the F9F Grumman Panther. The study was limited to those duties involving the 5 ratings which account for the bulk of the maintenance; the ratings were aviation machinist's mate, aviation electrician's mate, aviation structural mechanic, aviation ordnance man, and parachute rigger. The questionnaire, and accompanying check list, contained interrogations as to frequency with which each task is done, the pay grade of the man doing it, the time required to perform the task, and where the task should be taught in the naval training system. The check list had 8 sections, each concerning a major section of the aircraft. Recommendations are made regarding the assignment of personnel to maintenance tasks by rating and pay grade; each rating is assigned an area of the aircraft, and each area is subdivided into systems, and each system into units. Maintenance of each of the units is subdivided according to preventive maintenance, removal and installation of units, and adjustment and repair. No recommendation for modification of the General Service Rating structure is made, and the revised Navy Job Classification is considered adequate. (TIP abstract)

Hillesund, R. A. 1952
(THE PROPHYLAXIS OF ACOUSTIC TRAUMA) Støyskadeprofylakse. — Tidsskrift for den Norske Laegeforening (Oslo), 72 (10): 301-302. 1952. In Norwegian, with English summary (p. 302). DSG

The protection afforded by ear plugs made from glassfiber wool, vulcanite, or ordinary cotton against acoustic trauma was tested. Glassfiber wool was found to be superior to the other materials.

Hirsh, I. J. 1952
and W. D. Ward
RECOVERY OF THE AUDITORY THRESHOLD AFTER STRONG ACOUSTIC STIMULATION. — Harvard Univ. Psycho-Acoustic Lab., Cambridge, Mass. Report no. PNR-124, [1952]. 23 p., 13 plates. (Contract N5ori-76; TIP U20907). UNCLASSIFIED

Psychological correlates were determined for physiological observations of auditory fatigue. Human ears were exposed for several minutes to intensities of 100 to 120 db., with consequent fatigue which recovered in about 10 min. Recovery curves are given for the auditory thresholds for clicks, bands of noise, and pure tones. After acoustic stimulation by sounds containing fre-

quencies below 4000 c.p.s., the threshold-recovery curve for sounds containing some high frequencies is diphasic, with an initial rapid recovery in about 1 min. and a second rise after about another minute followed by a more gradual final recovery. The dependence of the recovery curve on frequency, in both the test and stimulating sounds, indicated that different frequency regions of the auditory system recover at different rates. (TIP abstract)

Hirsh, I. J. 1952a
and W. D. Ward
RECOVERY OF THE AUDITORY THRESHOLD AFTER STRONG ACOUSTIC STIMULATION. — Jour. Acoust. Soc. Amer., 24 (2): 131-141. 1952. DLC (QC221.A4, v. 24)

Same as the report, Hirsh, I. J., 1952.

Hitchcock, F. A. see Burch, B. H., 1952; Cole, C. H., 1952; Edelmann, A., 1952; Kemph, J. P., 1952, 1952a

Hobson, G. N. 1952
RUSHED TO THE HOSPITAL BY HELICOPTER. — Canadian Hospital (Toronto), 29 (9): 66. 1952. DSG

A popular, illustrated description of a rescue operation by helicopter of a man injured in a tractor accident near Smithern (British Columbia).

Hodges, W. E. see Sullivan, A., 1952

Hoelscher, B. 1952
and K. R. Reissmann
MECHANISMS OF ALTITUDE ADAPTATION. I. THYMUS-ADRENAL GLAND INTERRELATIONSHIP IN PARABIOTIC RATS UNDER HYPOXIA. — School of Aviation Medicine, Randolph Field, Tex. March 1952. 3+18 p. (Project no. 21-23-003, Report no. 5; TIP U22011). UNCLASSIFIED

Forty-five pairs of rats were joined in parabiosis by suturing together the scapulae and iliac bones. Of 15 pairs which survived, one of each pair was adrenalectomized and the other thymectomized. In Series I, the thymectomized parabiont was subjected to hypoxic stress while the adrenalectomized partner breathed normal air; in Series II, the hypoxic exposures were reversed. The adrenal cortex of the thymectomized parabiont was larger in Series I than in Series II. The thymus in the adrenalectomized parabiont was slightly larger in the second series. The livers and intestines were enlarged in both series. The heart of the thymectomized animal was always larger than that of its partner, but the increase was not so great if the adrenalectomized parabiont had been exposed to hypoxia. The increase in heart weights of single thymectomized rats exposed to hypoxia for 3 wks. was only 16% of the values noted for parabiotic thymectomized rats. (TIP abstract)

Hoelscher, B. 1952a
MUSCULAR STUDIES IN RATS ACCLIMATIZED TO COLD. I. A METHOD OF MEASURING MUSCULAR FATIGUE IN RATS. — School of Aviation Medicine, Randolph Field, Tex. June 1952. iii+5 p. (Project no. 21-33-002, Report no. 1; TIP U23215). PB 107152

A method is described for measuring the work output of the electrically stimulated masseter muscle of the rat during exposure to hypoxia. The anesthesized test specimen, slipped through a ring-shaped, water-filled pneumograph connected to a Statham strain gage, was strapped to an animal board enclosed in a small altitude chamber (25°C). The weighted lever of a 2-lever system was connected to the lower jaw by a linen thread looped around the incisors. A mechano-electrical transducer was used as the pickup device; the stimuli, muscular responses, EKG, and respiration were simultaneously recorded by a Grass ink-writer. This procedure provided information on the role of cardiac function in muscular fatigability, and the effect of cold acclimatization upon muscular work potential. (TIP abstract)

Hoelscher, B. see also Reissmann, K. R., 1952

Hollander, E. P. 1952
and J. T. Bair
THE SIGNIFICANCE OF ATTITUDES TOWARD AUTHORITY-FIGURES IN DISCRIMINATING BETWEEN NAVAL AVIATION CADETS OF "HIGH" AND "LOW" MOTIVATION. — Naval School of Aviation Medicine, Pensacola, Fla. May 27, 1952. 12+[14] p. (Project report no. NM 001 058.05.03; TIP U23182). UNCLASSIFIED

Attitudes toward "authority figures" [i.e. officer-instructors in the Naval Air Training Command] who discriminated between Naval Aviation Cadets of high and low motivation were evaluated. The high-motivation group consisted of 65 cadets who had successfully completed Basic Flight Training, and the low group included 72 cadets who withdrew from training voluntarily. Each person completed anonymously an open-ended questionnaire form that instructed him to describe a sample of behavior characteristic of his "best" instructor and "worst" instructor. Content analyses were undertaken, and frequencies for each content category were determined. Cadets of high motivation placed more value on interpersonal relationships with their instructors; the low group stressed the competence of the instructor in his role of teacher. Implications for the development of morale inventories are discussed. (TIP abstract)

Hollander, E. P. 1952a
and J. T. Bair
PRE-TRAINING ATTITUDES TOWARD AUTHORITY-FIGURES AS PREDICTORS OF INADEQUATE MOTIVATION AMONG NAVAL AVIATION CADETS. — Naval School of Aviation Medicine, Pensacola, Fla. Nov. 10, 1952. 5+vii p. (Project report no. NM 001 058.05.05; AD 1029). UNCLASSIFIED

Cadets entering the naval aviation program were required to complete an open-ended questionaire in which they described their best and worst high school or college instructor. Cadets who remained in the program for the 8-month study, described interpersonal relationships with

their instructors more frequently, whereas the cadets who withdrew voluntarily were more critical, evaluating teaching techniques with significantly greater frequency. (AD abstract)

Hollander, E. P. 1952b
AN INVESTIGATION OF THE RELATIONSHIP BETWEEN ACADEMIC PERFORMANCE IN PRE-FLIGHT AND ULTIMATE SUCCESS OR FAILURE IN BASIC FLIGHT TRAINING. — Naval School of Aviation Medicine, Pensacola, Fla. Nov. 24, 1952. 7+9 p. (Project report no. NM 001 058.17.01; AD 7794). UNCLASSIFIED

The predictive value of preflight academic grades on the success and failure of basic flight training was determined by correlating final preflight scores of 336 cadets with a pass-fail criterion from basic flight training. Cadets with academic deficiency on preflight had twice as great a failure and withdrawal rate as nondeficiency cadets. The preflight courses of navigation, aerology, principles of flight, and code gave highly significant correlations with the pass-fail criterion. The final preflight academic grades yielded a multiple correlation of 0.60 with flight performance. (AD abstract)

Hollander, E. P. see also Bair, J. T., 1952a

Holtzman, W. H. 1952
and M. E. Bitterman
PSYCHIATRIC SCREENING OF FLYING PERSONNEL. VI. ANXIETY AND REACTIONS TO STRESS. — Dec. 1952. iii+28 p. Univ. of Texas, Austin (Contract AF 33(038)-13887); issued by School of Aviation Medicine, Randolph Field, Tex. (Project no. 21-37-002, Report no. 6) (TIP U25846 and ATI 188 265). PB 108276

The psychological and medical literature on anxiety and reactions to stress was reviewed. The major topics covered are: anxiety reactions in military personnel, psychometric studies, stress tests, psychological concomitants of emotional disturbance, and anxiety and learning. The practical application of the research is to the measurement and prediction of incapacitating emotional conditions which are precipitated by the stress of combat and anticipation of combat. A bibliography of 265 references is attached. (TIP abstract)

Holtzman, W. H. see also Bitterman, M. E., 1952

Howard, J. K. 1952
and E. W. Pickrel
VALIDATION OF THE AIRMAN CLASSIFICATION BATTERY FOR WOMEN IN THE AIR FORCE. — Air Training Command. Human Resources Research Center. Personnel Research Lab., Lackland Air Force Base, Tex. Technical report no. 52-5, Nov. 1952. iv+31 p. (Project no. 503-001-0001; AD 1187). PB 108687

The Airmen Classification Battery (ACB) was investigated as a means of classifying women in the Air Force. A reliability study showed a range from 0.42 for the Mechanical Principles Test to 0.85 for the Clerical Aptitude Index. Reliability coefficients obtained in the male population were slightly, but not consistently, higher. With the exception of a lower mechanical experience factor, there was little difference in factor loadings between men and women. The Biographical Inventory was not effective in classifying women. The potential validity of the ACB for classifying women was as high as for men. (AD abstract)

Howell, T. W. see Beard, E. F., 1952, 1952a
Howell, W. D. see Edwards, T. M., 1952

Howland, D. 1952
FACTORS IN CONTROL DESIGN. — Eng. Exper. Station News, Ohio State Univ., 24 (5): 10-15. 1952. DLC (TA401.O5, v. 24)

Little research has been done in the field of proprioception, as compared to the many studies on visual and auditory perception. In modern aviation, where excessive speeds and unusual strain on the sensory functions are involved (excessive control surface loads), the "feel" characteristics on the part of the pilot are of particular importance. An experimental device to measure proprioceptive reactions is described. It consists basically of a control-handle mechanism coupled to a variety of measurable resistance elements (spring, viscous damping, moment of inertia, etc.). The test subject is asked to trace a changing line on an oscillograph screen by operating the handle (continuous pursuit task) and performance scores are recorded graphically. Evaluation of the results of the experiments is in progress.

Hsia, Y. 1952
and C. H. Graham
SPECTRAL SENSITIVITY OF THE CONES IN THE DARK ADAPTED HUMAN EYE. — Proc. Nat. Acad. Sci., 38 (1): 80-85. 1952. DLC (Q11.N26, v. 38)

A redetermined visibility curve was compared to the visibility curve as accepted by the International Commission of Illumination. The spectral sensitivity of retinal cones was determined by the threshold method in which a 42-mm.-diameter test field was viewed by a subject's dark-adapted eye, the field appearing in the center of a fixation ring as a thin, dim ring of white light subtending a visual angle of 2°. The measurements were made with a recalibrated double monochromator. The resulting curves exhibited higher visibility values in the blue end of the spectrum. The difference between the log visibility values at 555 and 410 mμ. was 1.8 log units; the difference for similar values according to the ICI curve was 3.0 log units. Visibility was at a maximum near 550 mμ. The visibility curve indicated two points of abrupt change in direction: one near 460 mμ. and the other near 600 mμ. (TIP abstract)

Hubbard, H. H. 1952
and L. W. Lassiter
SOME ASPECTS OF THE AIRCRAFT NOISE

PROBLEM. — Aeronaut. Eng. Rev., 11 (7): 28-33. 1952. DLC (TL501.A326, v. 11)

Recent studies of causes and prevention of airplane noises are reviewed. The following basic types of noises and their principal means of control are discussed: (1) noise from propellers—a decrease in sound intensity can be achieved by the use of more propeller blades; (2) noise from pulsing flow (pulse-jet engines)—exhaust mufflers reduce noise to a limited extent; (3) noise emanating from the mixing region of the jet—noise level in direct proportion to exit gas temperature at the higher jet velocities; and (4) noise from turbopropeller units. Various relief devices, such as sound-proofing, earplugs, and earplug and helmet combinations are discussed.

Hubbard, H. H. 1952a
A SURVEY OF THE AIRCRAFT-NOISE PROBLEM WITH SPECIAL REFERENCE TO ITS PHYSICAL ASPECTS. — National Advisory Committee for Aeronautics. Technical note no. 2701, May 1952. i+41 p. PB 106791 DNACA

This brief review of the physical and physiological aspects of noise includes a survey of the auditory and nonauditory effects of noise on the human organism. Correlations with work output and efficiency are discussed, and personal noise protection, as well as sound-proofing methods are outlined. A bibliography of 32 references is included.

Huerkamp, B. 1952
[REACTION OF RETINAL BLOOD VESSELS DURING ACUTE AND CHRONICAL CHANGES OF CIRCULATORY CONDITIONS] Das Verhalten der Netzhautgefässe bei akuten und chronischen Änderungen der Blutbeschaffenheit. — Albrecht von Graefes Archiv für Ophthalmologie (Leipzig), 152 (4-5): 491-513. 1952. In German. DSG

The thickness of retinal arteries and veins and the color of the optic papillae were observed in rabbits during stages of acute anoxia (breathing of pure nitrogen through a tracheal cannula). The blood vessels narrowed (arteries about 25%, veins about 20%), and the papillae turned a deep red. Upon breathing of fresh air these changes regressed to normal within 3 minutes. Tying off the carotid sinus and severing the vagus on both sides had a preventing effect on changes in the diameter of the retinal blood vessels during and after breathing of nitrogen. Similar experiments are described involving acute ischemia of the brain (complete blocking of blood influx into the brain) by means of a pressure collar. A rapidly progressing narrowing of the retinal blood vessels to the point of being completely undetectable, as well as discoloration of the papilla, were observed. A correlation of these findings with the diminishing of the corneal reflex was established. Loosening of the collar caused immediate dilatation of the retinal and papillary blood vessels and regression to normal within 10 minutes.

Huff, R. L. see Lawrence, J. H., 1952

Hull, W. E. 1952
R. H. Middleton
PHYSIOLOGICAL EXPERIMENTS ON EXPLOSIVE DECOMPRESSION. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. Memorandum report no. WCRDF-696-121, April 22, 1952, 11 p. (RDO no. 696-77; AD 6480). UNCLASSIFIED

Using the carotid blood pressure response as the index of the general level of chest pressure in an anesthetized dog subjected to explosive decompression, the influence of various levels of simultaneous counterpressure as supplied by a special restraining garment has been studied. The instrumentation used for obtaining data on physiological responses during explosive decompression is described. Some physiological responses of a dog explosively decompressed from simulated altitudes of 14,500 feet to 60,000 feet in 0.150 seconds are described. (From the authors' summary)

Hull, W. E. 1952a
EXPLOSIVE DECOMPRESSION. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. [1952]. 4 p. [Paper presented at Conference on Problems of Emergency Escape in High Speed Flight, 29-30 Sept. 1952, at Wright-Patterson Air Force Base, Ohio.] (AD 14 348). UNCLASSIFIED

Basic questions regarding the advisability and effectiveness of protective equipment against explosive decompression are discussed. The problem is mainly that of simplifying existing cumbersome protective clothing items and gears. While research on personal protective clothing should be further advanced, structural improvements of aircraft should be carried on with a view toward safety. The question of "safe window size" is briefly discussed. At altitudes above 45,000 feet, the altitude suit is an absolute necessity for protection against both hypoxia and explosive decompression injury.

Hull, W. E. 1952b
A DEVICE TO MEASURE PRESSURE APPLIED TO THE SKIN BY SPECIALIZED SUPPORTIVE GARMENT. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. Memorandum report no. WCRDF-696-121C, April 25, 1952. 11 p. (RDO no. 696-77; AD 51 058). UNCLASSIFIED

The development and use of an electrical recording instrument is described which measures the pressure applied to the skin by supportive garments. A bladder is placed beneath the supportive garment to be tested and the pressure is measured by an electrical differential pressure gage and recorded on a strip of sensitized paper. The method is accurate and free of the usual factors which cause instability.

Hull, W. E. 1952c
EXPLOSIVE DECOMPRESSION PROTECTION. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio.

WCRD Technical note no. 52-63, Sept. 1952. 22 p. (RDO no. 696-77) (TIP U69358). UNCLASSIFIED

Injurious effects of sudden atmospheric decompression are discussed. Protection against otherwise hazardous explosive decompression to very high altitudes may be obtained by use of the partial-pressure altitude suit. The principle of protection involves the sudden application of counterpressure to the body of the wearer. This counterpressure is obtained by the expansion of gases entrapped in partially inflated capstan tubes during the instant of decompression. The use of an emergency exhalation relief valve to provide a pathway for the egress of expired lung gases is described. An appreciable degree of protection may be obtained by the partial-pressure altitude suit when properly equipped and used in the manner prescribed, which includes: (1) application of the principle of "capstan ready-pressure", (2) provision for regulation of capstan pressure as required by the above principle, and (3) provision for rapid expulsion of lung gases as required during explosive decompression, which may be accomplished by the use of the emergency exhalation relief valve. (From the author's summary)

Hull, W. E. see also Vail, E. G., 1952a
Humm, J. H. see White, C. S., 1952

Hunley, H. C. 1952
AIR TRANSPORTATION OF ACUTE POLIOMYELITIC PATIENTS. — U. S. Armed Forces Med. Jour., 3 (9): 1337-1340. 1952. DSG

The harmful effects of air transportation of poliomyelitic patients with bulbar involvement in the acute stage, are discussed. Case histories of 40 patients transported by the U. S. Military Air Transport Service (MATS) reveal a significant correlation between fatality rate and air transportation. However, no absolute proof has been discovered to the effect that it was the air-borne portion of the journey that had adversely influenced the outcome of the disease.

Hunsaker, J. C. 1952
AERONAUTICS AT MID-CENTRY. — v + 116 p. New Haven: Yale University Press, 1952. DLC (TL515. H8)

The history of modern aviation, from its beginnings to date, is briefly reviewed, with emphasis on technical, political, sociological, economical, strategic, and physiological implications. Brief chapters are dedicated to airplane safety (p. 46-48), the human factor (p. 48-50), and elements of human engineering, such as automatic control devices (p. 50-54).

Hurley, L. A. 1952
and A. R. Buchanan
PROPHYLACTIC AND THERAPEUTIC VALUE OF HYDERGINE IN HIGH ALTITUDE FROSTBITE. — Surgery Gynecol. and Obstetrics, 95 (4): 423-430. 1952. DLC (RD1. S8, v. 95)

High-altitude frostbite is more intensive than common frostbite. Even relatively short exposure of extremities causes severe edema and gangrene. This is due to the combined action of anoxia, stasis, and subsequent vascular obliteration, all produced by vasospastic activity. The authors administered hydergine, an effective adrenergic blocking agent, to rats (to one group orally and to another subcutaneously), exposed them to a simulated altitude of 25,000 feet and a temperature of -50°C. for 15 minutes, and returned them to ground level and an ambient temperature of +30°C. A third group was treated subcutaneously after freezing, and a fourth group served as control. While the first (edematic) stage of frostbite was almost identical in all four groups, the rats treated prophylactically (both orally and subcutaneously) showed remarkably less severe necrosis in the after-stage (loss of tail and toes). The animals which had received injections of the alkaloid after freezing showed the same effects to a somewhat lesser degree.

Hyde, R. W. 1952
AEROTITIS MEDIA: A CRITICAL REVIEW. — Ann. Otol. Rhinol. and Laryngol., 61 (4): 937-975. 1952. DLC (RF1. A6, v. 61)

The etiology, symptoms, diagnosis, prevention, and treatment of aerotitis media are discussed. Complications such as permanent deafness were found to be very uncommon, and the prognosis is generally good.

Hyde, R. W. 1952a
AEROTITIS MEDIA. — School of Aviation Medicine, Randolph Field, Tex. Special report, Oct. 1952. iii+22p. (DSG) PB 108273

Essentially the same as the paper, Hyde, R. W., 1952.

Illingworth, R. S. see Browne, R. C., 1952
Inaba, K. see Alluisi, E. A., 1952b

Ingalls, T. H., 1952
F. J. Curley, and R. A. Prindle
EXPERIMENTAL PRODUCTION OF CONGENITAL ANOMALIES: TIMING AND DEGREE OF ANOXIA AS FACTORS CAUSING FETAL DEATHS AND CONGENITAL ANOMALIES IN THE MOUSE. — New England Jour. Med., 247 (20): 758-768. Nov. 13, 1952. DLC (R11. B7, v. 247)

Mice at various stages of pregnancy were exposed to a simulated altitude of 27,000 feet for 15 minutes and then returned to ground-level pressure. As compared to controls, the exposed mice showed the following anomalies: (1) greater disparity between corpora lutea and embryos; (2) a higher embryonic death rate (21. 1% as compared to 12. 4% at ground level) with a peak in the group exposed during the second week of gestation; and (3) various congenital malformations, such as septal defects, anencephaly, irregularities and fusions of ribs and vertebrae, cryptorchidism,

cleft palate, and open eye. Each of these deformities could be related to exposure at a definite stage of pregnancy.

Jackson, M. M., E. Shocket, and H. C. Dyme 1952
THE EFFECT OF MODERATE ALTITUDE UPON HUMAN GASTRIC EMPTYING TIME. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-74, March 1952. v+18 p. (RDO no. 696-80; TIP U23409). UNCLASSIFIED

The relative difference in gastric emptying times was determined in volunteers at ground level or at simulated altitudes of 12, 500 and 15, 000 ft. by serial roentgenography of the subjects' gastrointestinal tracts. A pressure-resistant, X-ray-penetrable, plastic window in the door of the decompression chamber permitted the X-ray films to be exposed without periodically removing the subjects from the chamber. The films were taken at 5 minutes, 1 hour, and 2 hours after eating, the results being tabulated according to the Annegers-Ivy method (Gastroenterology, 8:711, 1947). The subjects were equilibrated at the simulated altitudes for only 20 min. before eating the standard Ba meal. The results indicated no significant difference in gastric emptying times at any of the test altitudes. An increase in altitude causes a decrease in oxygen and barometric pressure; these two factors are postulated to be mutually antagonistic in their effect on gastric motility, thereby nullifying the effects of each other and leaving the stomach to empty at a constant rate. (TIP abstract)

Jaeger, W. 1952
[ON THE EFFECT OF EXPOSURE TIME ON THE MINIMUM SEPARABILE] Über den Einfluss der Darbietungszeit auf das Minimum separabile. — Klinische Monatsblätter für Augenheilkunde (Stuttgart), 121 (3): 340-345. 1952. In German. DSG

The relation between the light intensity of two approaching luminous target points, the duration of observation (exposure), and the minimum separabile (i. e., the smallest distance at which the two points can be distinguished by an observer) was determined experimentally on 10 subjects and plotted on a curve. The experiments revealed the existence of a threshold value for "stimulus energy" (intensity times duration) below which no separation of points was perceived. If the target-point distance is increased, the minimum observation time is not shortened proportionately.

Janitz, A. E. 1952
INTRODUCTION TO HUMAN ENGINEERING IN PRODUCT DESIGN. — Elec. Manufacturing, 49 (3): 90-96. DLC (TK1. E362, v. 3)

When an engineer designs a specific machine, he has to consider the human engineering factor and make clear the purpose for which the machine will be used. This involves two processes: (1) a job analysis of the human operator in his relation to the machine in terms of comfort, safety, speed of learning, and efficiency; and (2) a machine performance analysis with regard to speed and accuracy of the machine. The major physiological and psychological research related to human engineering covers the following areas: functional use of the body (anthropometric considerations), vision, hearing, skin sensitivity and proprioception, motor responses, and physiological conditions in relation to efficiency. Consumer's preference and appearance may coincide with human engineering requirements but do not necessarily have a bearing upon the scientific evaluation. — Today, the human operator has to be considered a part of the man-machine system. The psychological approach should therefore be a part of a design engineer's equipment.

Johnson, A. D. see Welch, G. E., 1952
Johnson, E. E. see Martin, W. B., 1952
Johnson, M. N. see Hall, A. L., 1952c
Johnson, P. C. see Bean, J. W., 1952a

Johnson, W. 1952
UTILIZATION OF IBM ACCOUNTING MACHINES FOR THE RAPID COMPUTATION OF THE POINT BISERIAL CORRELATION COEFFICIENT IN ITEM VALIDATION. — Naval School of Aviation Medicine, Pensacola, Fla. Aug. 19, 1955. 9+2 p. (Project report no. NM 001 058. 24. 02; TIP U24475). UNCLASSIFIED

The components of the formula for point biserial correlation, where item omissions are frequently encountered, were computed by a method utilizing IBM punched-card machines. The method was applied in an analysis of 164 items on an experimental check-flight form used in a study of student flight proficiency for naval air training. Twenty cards were used for each student, one for each page of the form. The most usable method with which to produce the results seemed to be a listing of each individual's criterion score so that it appeared in one column if he passed the item, and in another if he failed. Model-402 IBM accounting machine, equipped with 4 digit selectors and 80 counter positions, could accommodate 4 items at a time. Since the items on each page appeared in the same columns of cards for those pages, the first 4 items on each of the 20 pages could be listed as described in one run through the machine. The machine prepared pass and fail distributions for 80 items at one setting. Any other 4 columns could then be analyzed in the same manner by a change of only 8 wires. The printed form as it appeared from the accounting machine contained criterion scores only for persons who actually responded to a particular item. (TIP abstract)

Johnson, W. see also Clark, B., 1952d; Niven, J. I., 1952; Poe, A. C., 1952a; Wilcoxon, H. C., 1952

[Johnson, W. H.] 1952
AIR SICKNESS. — Air Facts, 15 (8): 61-63. 1952. DCAA

According to findings by Dr. Walter H. Johnson of Toronto, Canada (with the assistance

of colleagues from the Royal Canadian Air Force Institute of Aviation Medicine), head motion is the primary cause of seasickness. Any device which keeps the head at rest will reduce the danger of motion sickness. Walking around should be avoided. — An electronic device measuring proneness to motion sickness connected with an electrically operated swing is briefly described.

Johnson, W. H. 1952a
THE IMPORTANCE OF HEAD MOVEMENTS IN THE PRODUCTION OF MOTION SICKNESS. — Defence Research Board (Canada). April 1952. ii+6+11 p. (DRML Project no. 20-1; TIP U22185). UNCLASSIFIED

The effects of head movements on motion sickness were investigated in human subjects during runs on a simple harmonic hand-propelled iron swing. Individual differences in susceptibility to motion sickness appeared dependent upon the degree of movement of the head relative to the rest of the body. Sickness was abolished in susceptible individuals by holding the head in a fixed position with a strap passed around the forehead from the back of the seat. Of 100 subjects with heads in the fixed position, 5 became sick as compared to 37 in a control group. An electronic recorder was built which measured head movements in response to motions imposed on the body by the vehicle. (TIP abstract)

Johnston, M. B. 1952
FLIGHT COMFORT AND SAFETY OF PATIENTS. — Jour. Aviation Med., 23 (1): 10-14. 1952. DLC (TL555.A1A4, v. 23)

Describes the equipment of a transport plane (C-54M) of the U. S. Military Air Transport Service, designed for the evacuation of military patients with particular regard to comfort and safety. The following features of the plane are discussed: internal lining of the cabin (easily cleaned), temperature control and ventilation, reduction of vibration, arrangement of litters (variable capacity), and galley. Measures are taken to safeguard the patients in emergency landings: crew drills, securing of cargo and equipment, escape slide, life vests, and life raft. Plans for future improvements include the design of a plane with increased capacity (100 patients), with hospital facilities, and improved loading and unloading procedures.

Jolly, R. see Damasio, R., 1952; Tabusse, L., 1952a, 1952c

Jones, Earl I. 1952
and Bilodeau, E. A.
DIFFERENTIAL TRANSFER OF TRAINING BETWEEN MOTOR TASKS OF DIFFERENT DIFFICULTY. — Air Training Command. Human Resources Research Center. Perceptual and Motor Skills Research Lab., Lackland Air Force Base, Tex. Research bulletin no. 52-35, Dec. 1952. 23 p. (Project no. 509-020-0001; AD 3780). UNCLASSIFIED

Two different track patterns were constructed for a pair of two-hand coordination tasks which were equated in other respects. One task (a clover pattern) was more difficult than the other (a circle pattern) in appearance and in terms of the responses required for mastery. Statistical tests of the performance scores on the two tasks indicated the following: (1) Transfer from a complex to a simple task is as great as or greater than the effect of direct practice on the simple task; (2) transfer from a complex to a simple task is greater than transfer from a simple to a complex task; and (3) transfer from a simple to a complex task is positive but less effective than direct practice on the complex task. (AD abstract)

Jones, H[orace] L. 1952
and E. Reeves
OBSERVATIONS ON WEATHER-SENSITIVE ARTHRITICS DURING CONTROLLED EXPOSURES AT LOW AND HIGH ATMOSPHERIC PRESSURES. — Jour. Aviation Med., 23 (1): 77-84. 1952. DLC (TL555.A1A4, v. 23)

Earlier studies by various authors indicate that the weather sensitiveness of arthritic patients is related to changes in the barometric pressure. Simulated altitudes (3000-9000 feet) seem to increase the number of joints in which arthritic pain is felt. — The present paper deals with the response of 5 arthritic patients to increased barometric pressure (up to $\frac{1}{2}$ atmosphere); 2 of them experienced a decrease in pain at increased pressure. The problem needs further investigation.

Jones, Walton L. 1952
THE FLIGHT SURGEON AND FLIGHT SAFETY. — Jour. Aviation Med., 23 (1): 44-48, 84. 1952. DLC (TL555.A1A4, v. 23)

An outline is given of the duties of the flight surgeons of the U. S. Navy, with special reference to flight safety. The duties include: the selection and maintenance of aviation personnel; the development and improvement of safety equipment; in case of aircraft accidents, the care of the injured and the investigation of the cause of the accident; and dissemination of safety information among aviation personnel.

Jones, Walton L. 1952a
THE VALUE OF PROTECTIVE HELMETS IN AIRCRAFT CRASHES. — Jour. Aviation Med., 23 (3): 263-270. 1952. DLC (TL555.A1A4, v. 23)

Protective helmets came into use in the American Navy aviation in 1948. The author surveyed all the fighter and attack aircraft accidents occurring in three consecutive years (1948-1950) and involving major damages to the planes: there were 39 cases where injuries could have been reduced or avoided, had the pilots worn protective helmets. Some of the American Navy pilots, however, were using protective helmets to great advantage. Of 78 pilots wearing protective helmets and exposed to air crashes resulting in major damage, 26 sustained head injuries in spite of the

helmets. Experience has shown that it is very important that the chin straps be fastened, since without them the protective value of the helmet is much reduced. Forces affecting the helmet should not be deflected; on the contrary, the helmet should absorb the energy by controlled destruction of the material in the helmet. Further study is needed with regard to the mechanical properties and the energy-absorbing composition of the materials.

Jongbloed, J. 1952
[MAN AND MACHINE] L'homme et la machine. — Aeromedica acta (Soesterberg, Netherlands), 1: 13-21. 1952. In French.
DSG

The tasks of the modern flight surgeon are briefly outlined. Ever-increasing speeds and technical complexities of the airplane are creating problems which are more the concern of human engineering than of aviation medicine. However, the activities of the flight surgeon are still in great demand, particularly in such fields as selection of trainees, mental and physical hygiene, and hazard prevention, in addition to the normal medical and surgical functions. The contribution of the Netherlands to the advance of aviation medicine is extolled.

Jordi, A. U. 1952
ACUTE POISONING BY TRICRESYLPHOSPHATE. — Jour. Aviation Med., 23 (6): 623-625. 1952.
DLC (TL555.A1A4, v. 23)

Pathological manifestations following accidental ingestion of tri-ortho-cresylphosphate by 80 members of the Swiss Army are discussed in detail. The initial symptoms, vomiting, profuse diarrhea, etc., disappeared after 5-6 days. After a brief latency period, other symptoms set in: in slight cases, paralysis of the limbs, and in severe cases, paralysis of the arms and of the psoas developed, due to neuritis of the motor fibers. Slightly affected soldiers recovered within 18 months, in severe cases (25%), however, paralysis is still continuing. — Tricresylphosphate is used in hydraulic fluids for military and civilian airplanes (in concentrations of 6-10%) and has lately been used as an additive to aviation gasoline.

Jordi, A. [U.] 1952a
[TRANSPORTATION OF PATIENTS BY PLANE] Transport von Kranken mit Flugzeugen. — Schweizerische medizinische Wochenschrift (Basel), 82 (5): 109-111. Feb. 2, 1952. In German.
DSG

A summary is presented of the latest practical experiences with, and research reports on, transportation of passengers afflicted with various diseases or physical handicaps in commercial airplanes. Certain general rules and standards of acceptance or rejection of passengers have been adopted by many airlines (e. g., passengers should be able to use the toilet unaided, passengers with incontinence of the feces or the urine should be excluded, etc.). The following diseases and their importance with regard to admissibility of passengers are briefly discussed: anemia, leukemia, cardiovascular diseases (angina pectoris, coronary infarct, myocarditis, and high blood pressure), diseases of the bronchi and the lungs, diseases of the digestive tract (ulcers, appendicitis, etc.), diseases of the liver and the urogenital system, metabolic disturbances (diabetes, Basedow), pregnancy, old age, and neuromuscular disturbances (brain tumor, epilepsy, poliomyelitis, and psychic disturbances). In each case the advisability of air transportation and possible precautions before and during flight are indicated.

Jungmann, H. 1952
[EFFECTS OF MOUNTAIN TRIPS (OBERSTDORF-NEBELHORN) ON THE CARDIOVASCULAR SYSTEM] Kreislaufwirkungen von Bergfahrten (Oberstdorf-Nebelhorn). — Zeitschrift für die gesamte experimentelle Medizin (Berlin), 119 (3): 280-285. 1952. In German. DSG

The physiological effects of relatively small altitude increases (1,100 m.) were demonstrated on a group of 10 healthy subjects who undertook a trip by cable car from Oberstdorf, Germany (800 m.) to the nearby Nebelhorn mountain (1900 m.). All tests were carried out 2 hours after arrival with the subjects at rest. An increase in pulse-wave velocity, attributed to a distention of the aorta and resulting in an increase of the cardiac output (in spite of decreased blood pressure), was observed. The pulse frequency increased while peripheral circulatory resistance decreased. Deviations from these findings observed on 5 sympatheticotonic subjects are described.

Kalian, P. see Cassen, B., 1952
Kanwisher, J. see Spragg, S. D. S., 1952
Karstens, A. I. see Corliss, H. H., 1952

Kater, N. M. 1952
HELICOPTER EVACUATION IN KOREA. — Med. Jour. Australia, 2 (11): 373-374. 1952.
DSG (W3 AU677, v. 2)

Helicopter evacuation in Korea was connected with MASH (Mobile Army Surgical Hospital) services. These hospitals were situated a short distance behind the forward positions and were provided with a neurosurgical team. Helicopters could also land on the deck of large hospital ships near the coast.

Keator, J. E. see Hale, H. B., 1952
Keeton, R. W. see Marbarger, J. P., 1952
Kelley, E. B. see Doyle, J. T., 1952a

Kemph, J. P. 1952
and F. A. Hitchcock
CHANGES IN BLOOD AND CIRCULATION OF DOGS FOLLOWING EXPLOSIVE DECOMPRESSION TO LOW BAROMETRIC PRESSURES. —

Amer. Jour. Physiol., 168 (3): 592-600. 1952.
DLC (QP1.A5, v. 168)

Dogs were subjected to explosive decompression, and oxygen and carbon dioxide concentrations, hematocrit, and corpuscular hemoglobin of the blood were determined at various terminal pressures. At pressures between 400 and 50 mm. Hg, the oxygen concentration was decreased, but below 50 mm. Hg it showed a marked increase (apparently due to blocking of the circulation by intramuscular gas bubbles). The carbon dioxide content was found constant up to 200 mm. Hg and decreased from there on until a 40 mm. Hg pressure was reached. Microscopic blood samples revealed no remarkable changes in the formed elements nor was there any variation of the mean corpuscular hemoglobin concentration. Five of six dogs that survived explosive decompression and recompression to ground level had an increased hematocrit (probably due to recompression), while two of three dogs that died showed a decreased hematocrit. Macroscopic gas bubbles were observed in the blood extracted from the carotid artery and external jugular veins. Bubbles were also seen in arteries and veins left intact.

Kemph, J. P., 1952a
F. M. Beman, and F. A. Hitchcock
SUBCUTANEOUS PRESSURE DEVELOPED IN DOGS FOLLOWING EXPLOSIVE DECOMPRESSION TO 25 OR 30 mm. Hg. — Amer. Jour. Physiol., 168 (3): 601-604. 1952.
DLC (QP1.A5, v. 168)

Dogs were explosively decompressed from 740 to 25 mm. or 30 mm. Hg in about 0.02 second, exposed to the terminal pressures for 60 seconds, and then recompressed to normal atmospheric pressure. Subcutaneous pressure was measured by 4 different methods. An increase of subcutaneous pressure to an average of 34 mm. Hg differential pressure (or 59 mm. Hg absolute pressure) was observed 60 seconds after explosive decompression to 25 mm. Hg ambient pressure. At an ambient pressure of 30 mm. Hg an initial pressure of 24 mm. Hg was recorded, which rose to 26 mm. Hg. This increase in the subcutaneous pressure is attributed to the vapor pressure of the body fluids plus the pressure of gases present in the vaporized fluids (CO_2, O_2, N_2, etc.). Upon recompression, a decrease of subcutaneous pressure to 0 mm. Hg or even a negative value was observed, which may be due to loss of water vapor from the subcutaneous needle of the recording instrument to the subcutaneous compartment. Water vapor was found to be the principal component of the gas phase.

Kemph, J. P. see also Burch, B. H., 1952; Cole, C. H., 1952

Kendricks, E. J. 1952
AEROMEDICINE: THE DOMINANT SCIENCE. — Aero Digest, 64 (1): 72-80, 82-90. 1952.
DLC (TL501.A282, v. 64)

The physiological problems resulting from the advances of modern aviation in high-altitude and high-speed flying are briefly discussed. New methods and techniques in meeting problems such as temperature and pressure changes, anoxia, bio-acoustic effects, bailing out from high altitudes, and instrument control (human engineering) are summarized. In conclusion, the requirements for and the functions and duties of the flight surgeon are outlined.

[Kennebeck, G. R.] 1952
AIR FORCE DENTAL HEALTH AT BEST. — Military Surgeon, 110 (6): 449. 1952.
DLC (RD1.A7, v. 110)

The increase in the staff of dentists in the U. S. Air Force has resulted in a remarkable improvement of dental health among the Air Force personnel. During the first 60 days in the Air Force each airman and officer is given a thorough dental examination including x-rays, followed up by meticulous treatment. This procedure applies to the zone of interior as well as to overseas bases.

Kennedy, J. V. 1952
THE PARTIAL PRESSURE SUIT IN HIGH ALTITUDE ESCAPE. — Wright Air Development Center, Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. [1952]. 3 p. (Paper presented at Conference on Problems of Emergency Escape in High Speed Flight, Sept. 29-30, 1952, at Wright-Patterson Air Force Base, Ohio) (AD 14 350). UNCLASSIFIED

A partial-pressure suit is described, which permits bailout from altitudes above 50,000 feet. The helmet is designed to seal pressures up to 3 p. s. i., while the suit itself maintains the proper pressure relationship within the cardiovascular system by means of mechanical counterpressure applied to the surface of the entire body (except hands and feet) by means of inflatable tubes (capstans). They extend along the arms, legs, and torso, and are attached to the suit in such a way that upon inflation they act as levers and tighten the inelastic undergarment against the body. The main shortcomings are the following: (1) restricted mobility when inflated; (2) requirement for other protective clothing (e. g. anti-g suit); and (3) uncertain wind-blast protection afforded by the helmet (future helmets are to be designed to withstand a blast of 10 p. s. i. or about 750 m. p. h. at sea level).

Kennedy, J. V. see also Mahoney, D. I., 1952

Kerr, T. H. 1952
PILOT ESCAPE FROM SPINNING AIRCRAFT. — Royal Aircraft Establishment (Gt. Brit.), Farnborough. Tech. Note no. Aero 2199, Dec. 1952. 8 p., 16 plates (ATI 199 859).
UNCLASSIFIED

A series of pilot escape tests from models of elementary and advanced trainers, and fighter aircraft in the spin are presented. Escapes were

made from varying points relative to the wing chord, on the inboard and outboard sides of the spin. The analyzed results show that if the pilot requires to bale out from a spinning aircraft, it is best to leave on the outboard side of the aircraft and in the crouching attitude. In this condition it is most probable that he will clear the aircraft cleanly and be outside the spiral flight path within a half turn of the spin. If he bales out on the inboard side, his flight path will probably be through or very near the propeller disc and it will probably take at least two turns of the spin for him to clear the helical flight path of the aircraft. (Author's summary)

Kettner, N. W. see Guilford, J. P., 1952
Kety, S. S. see Wechsler, R. L., 1952

Kimeldorf, D. J. 1952
and B. D. Newsom
SURVIVAL OF IRRADIATED RATS DURING PROLONGED EXPOSURE TO ENVIRONMENTAL COLD. — Amer. Jour. Physiol., 171 (2): 349-353. 1952. DLC (QP1. A5, v. 171)

Rats were irradiated with lethal doses of X-rays and exposed to a temperature of 6° C. which had previously been found to be well tolerated by non-irradiated animals. A second group of simultaneously irradiated rats was kept at 23° C. The mortality rate was found to be considerably higher in the cold-exposed irradiated animals than in the irradiated rats maintained in the 23° C. environment. The increased metabolic rate during cold exposure may be the cause of the higher mortality at low temperatures.

Kimeldorf, D. J. 1952a
and B. D. Newso[m]
THE SENSITIVITY OF IRRADIATED RATS TO CONDITIONS OF LOW OXYGEN TENSION AT REDUCED BAROMETRIC PRESSURES. — Naval Radiological Defense Lab., San Francisco, Calif. Interim report no. USNRDL-340, March 11, 1952. 18 p. (TIP U21825). UNCLASSIFIED

Rats exposed to a lethal dose (800 r) of X-radiation were subjected to the hypoxic environment of a simulated altitude of 20, 000 ft. for 4 hrs., or simulated altitudes of 40, 000 to 60, 000 ft. for 1 min. The hypoxic tolerance of the irradiated rats was similar to that of nonirradiated rats regardless of the amount of radiation received or the length of time between irradiation and exposure to hypoxia. Females had a significantly greater hypoxic tolerance than males. Heavier animals were more resistant than lighter animals of the same sex. (TIP abstract)

Kimeldorf, D. J. 1952b
and B. [D.] Newsom
THE SURVIVAL OF IRRADIATED RATS DURING PROLONGED EXPOSURE TO ENVIRONMENTAL COLD. — Naval Radiological Defense Lab., San Francisco, Calif. Report no. USNRDL-350, June 3, 1952. 16 p. (TIP U22523). PB USNRDL-350

Same as the paper, Kimeldorf, D. J., 1952.

King, B. G. 1952
FUNCTIONAL COCKPIT DESIGN. — Aeronaut. Eng. Rev., 11 (6): 32-40. 1952.
DLC (TL501. A326, v. 11)

Studies on anatomical and physiological characters of the pilot as related to cockpit design are reviewed and the data evaluated. The following are the principal criteria considered: (a) visibility; (b) location of controls; (c) stability of the seating arrangement. A visibility scoring system has been introduced, based on the ratio

$$W = \frac{\text{Total solid angle of windshield-window area}}{\text{Solid angle of human visual field}};$$

however, the optimum score has not been determined yet. Control and seat arrangements cannot be determined by a standardized formula. The author suggests that the manual controls and the windshield be brought closer to the pilot, which would provide for easier manipulation and improve visibility. An average knee angle of 109° was found optimum with regard to rudder-brake pedal operation. As to body stability, it would be desirable to reduce the pilot's dependence on primary flight controls for support (rudder pedals and wheel).

Kistler, K. see Cassen, B., 1952a, 1952b

Kline, R. F. 1952
ROLE OF ADRENAL GLANDS IN THE PLASMA AND URINARY ELECTROLYTE CHANGES DURING MODERATE AND SEVERE ANOXIA. — Federation Proceedings, 11 (1 I): 84. 1952. DSG

Normal nephrectomized and splanchnectomized cats, exposed to a simulated altitude of 28,000 feet for 90 minutes, showed a decrease in plasma potassium. Adrenalectomized or nephrectomized-adrenalectomized animals showed, however, no reduction in plasma potassium under identical conditions. This shows the predominant influence of the adrenal medulla at higher altitudes, causing large and rapid increases in plasma potassium value similar to those caused by injection of adrenaline.

Knoell, D. 1952
and D. G. Forgays
INTERRELATIONSHIPS OF CRITERIA OF COMBAT CREW PERFORMANCE IN THE B-29. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. CCT 52-1, Dec. 1952. 19 p. (Project no. 511-023-0001; AD 144).
UNCLASSIFIED

Intercorrelations of 35 criteria of B-29 combat-crew performance and 3 predictor variables were computed and factor-analyzed. A modified multiple-group factoring method was employed. Eight factors were extracted and rotated to a simple structure. Five of the factors appear to represent measures of the over-all crew, subteam, or individual in-flight effectiveness and/or

coordination. Two represent the ground-school performance of two of the crew specialties, pilot and gunner; one factor includes crew means on 3 attitude scales. The last predictor variables form a factor independent of the criterion variables which they were designed to predict. The analysis yields suggestions for reducing the numbers of criterion variables in research on factors related to B-29 crew performance. (AD abstract)

Knoepfel, H. K. 1952
[THE HELICOPTER IN RESCUE SERVICE] Der Helikopter im Rettungsdienst. — Vierteljahrsschrift für Schweizerische Sanitätsoffiziere (Basel), 29 (3): 159-162. 1952. In German.
DSG

The use of helicopters for evacuating casualties during the Korean War is described and the literature on the subject reviewed. The first instance of a helicopter rescue (on the Korean front) dates back to August 1950. By Christmas, 1950, 655 casualties had been evacuated, and by April 1951 the number had risen to 1,000. Helicopters also proved their usefulness in the U. S. Navy, particularly where transportation of casualties from land to ship or from ship to ship was involved. The practicability of helicopters for rescue missions depends largely on military and tactical (necessity of fighter protection against aerial and ground fire, poor maneuverability, etc.) as well as medical factors. The high cost of construction and maintenance likewise has to be taken into consideration. Strong winds and high altitudes prevent the use of helicopters (the highest altitude at which a rescue mission has been carried out was 2,500 m.). Under combat conditions the use of very large helicopters may not be advisable, because of the fact that they represent a perfect target and are less mobile than smaller craft.

Kobrak, H. G. 1952
BIOPHYSICS OF SOUND PERCEPTION IN REGARD TO PHYSIOLOGY. — In: Noise—causes, effects, measurement, costs, control, p. 71-76. Ann Arbor, Mich.: Univ. of Mich. Press, 1952.
DLC (RA772.N7M5)

In reviewing the physiological function of normal hearing, the following aspects are discussed: the prerequisites of hearing sensation based on adequate stimuli; frequency range and intensity range of hearing; and the essential structural and functional characteristics of the human ear. — While the normal human ear is usually not injured by sound stimuli in nature, man-created noise in the machine age may induce acoustic trauma. The defense mechanisms of the ear provide the following protection against extremely loud sounds: (1) the magnitude of reflexes of the tensor tympani and the stapedius muscles of the middle ear is directed by the intensity of the sound; (2) under strong acoustic stimulation, sudden changes occur in the vibration of the stirrup which reduce the impact on the fluid column of the inner ear; (3) the position of the two labyrinthine windows lowers the effects of a shock pulse in case the ear drum is perforated; and (4) auditory adaptation, a psychological phenomenon observed when the ear is exposed to stimuli of long duration.

Koochembere, C. T. 1952
HUMAN FACTORS RELATIVE TO THE PROBLEM OF ESCAPE-EJECTION ACCELERATIONS. — Naval Air Experimental Station. Aeronautical Medical Equipment Lab., Philadelphia, Pa. [1952]. [1952]. 5 p. [Paper presented at Conference on Problems of Emergency Escape in High Speed Flight, Sept. 29-30, 1952, at Wright-Patterson Air Force Base, Ohio.] (AD 14 347).
UNCLASSIFIED

German and British experiments on human tolerance to acceleration are reviewed. On the basis of the data obtained in these experiments, the Martin Baker Aircraft Company developed a high-performance catapult, on which test subjects were exposed to 17-21 g over periods from 0.15-0.25 seconds. No injuries or undesirable side reactions were sustained. The firm developed a face curtain "for effectively maintaining the proper body and head position and relieving some of the loading on the vertebrae during ejection." In 1946, the Aeronautical Medical Equipment Laboratory at Philadelphia, Pa. carried out additional experiments with live subjects on the Martin Baker catapult, employing more elaborate instrumentation. Although no specific conclusions as to the maximum g tolerance in the seated position were established, 18-21 g were tolerated during the ejection strokes without injury or notable discomfort.

Koolstra, J. 1952
[BRIEF OBSERVATION ON OXIMETRY IN AVIATION MEDICINE] Korte beschouwing omtrent de oxymetrie in de luchtvaartgeneeskunde. — Aeromedica acta (Soesterberg, Netherlands), 1: 99-103. 1952. In Dutch, with English summary (p. 101-102).
DSG

The oxygen saturation of the arterial blood was measured on 29 pilots by using the "Cyclops" apparatus (designed by Brinkman), which records the intensity of light reflected from capillaries of the forehead. Measurements were made during voluntary apnea after maximal inspiration or maximal expiration. In the majority of cases, the oxygen percentage in the arterial blood was found to be reduced much faster and more markedly after maximal expiration.

[Kramer, K.] 1952
HYPOXIA WARNING DEVICE FLASHES AUTOMATIC DANGER SIGNAL. — Tech. Data Digest (U. S., Central Air Documents Office), 17 (3): 6. 1952. DLC (Z5063.A2U65, v. 17)

An automatic photoelectric warning device, which flashes a danger signal whenever the arterial oxygen content drops below 80% (from the normal concentration of 98%) was developed at the Air Force School of Aviation Medicine by Dr. Kurt Kramer. The main feature of the device is a small lamp bulb and a photoelectric cell, built into

the ear cover of the pilot's headset. The bulb sends a ray of red or infrared light through the transparent cartilage of the ear. When the flyer's oxygen supply decreases, the blood changes from a bright red to a heavier, darker red, which causes the cell and the amplifying unit to register and transmit the change in any desirable form (light signal or buzz). The set has not been flight-tested, but has proven highly reliable under simulated conditions up to 80,000 feet.

Krebs, A. T. 1952
THE BIOLOGICAL EFFECTS OF LABORATORY RADIATION. — In: Physics and medicine of the upper atmosphere: a study of the aeropause, p. 267-289. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico Press, 1952. DLC (RC1050.U5, 1952)

The biological effects of the various forms of radiation can be attributed to two fundamental physical processes: excitation (raising of an electron in an atom or molecule to a higher energy level—ultraviolet radiation) and ionization (ejection of an electron from an atom — X-rays and cosmic radiation). A visualization of these processes has been effected by superimposing Wilson cloud-chamber pictures on biological micrographs. Results of these experiments are summarized and sample photographs are reproduced. A systematic grouping of functional and mutagenic effects, as related to the various types of radiation, is presented. Biological effects are proportional to the ion density produced by the different forms of radiation (specific ionization). It is known that the heavy nuclei of cosmic rays present at high altitudes (above 70,000 ft.) possess a very high specific ionization. The majority of data available at present with regard to health hazards due to cosmic and solar radiations have been deduced by extrapolation of laboratory experiments. More insight may be obtained by simulating cosmic radiation with machines capable of producing highly ionizing particles, particularly mesons.

Krebs, A. T. 1952a
METHODS OF ASSESSING THE BIOLOGIC EFFECTS OF IONIZING RADIATION. — In: Physics and medicine of the upper atmosphere: a study of the aeropause, p. 461-470. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico Press, 1952. DLC (RC1050.U5, 1952)

Methods are reviewed of determining morphological and physiological changes in organisms due to ionizing radiation, as well as mutagenic effects, general health hazards, and survival rates. Protection may be achieved by chemical means, e.g., administration of cysteine. The use of biological indicators to measure the effects of radiation is discussed (e.g., Phycomyces Blakesleeanus reacts to doses of several thousandths of one roentgen with a typical change in its growth rate). The application of various methods to the study of cosmic radiation is emphasized.

Krendel, E. S. 1952
THE SPECTRAL DENSITY STUDY OF TRACKING PERFORMANCE. THE EFFECT OF INSTRUCTIONS. — Jan. 1952. v+16 p. Franklin Institute, Philadelphia, Pa. (Contract AF 33(038)-10420); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-11, part 1 (RDO no. 694-39). (TIP U69384).
PB 108296

Quantitative information about human frequency response functions in the control of a piloted aircraft would provide a rational basis for stability and control criteria. Were the pilot a linear, time-invariant system, the ratio of the spectral densities of his output signal to his input signal would be the square of the transfer function describing the pilot. In addition, the computation of these spectral densities affords valuable insights into the response process under study. In an effort to examine the invariance of human system parameters, an attempt was made to change an operator's tracking responses by using two different sets of instructions for the tracking of the same statistical input. Two subjects were used in a simple compensatory position tracking device. Although the amplitude response characteristics do not conclusively prove or disprove the invariance of the response patterns, the spectral densities of the signals provide insight into the manner in which the type of instructions affected the response. The value of future research is indicated. (Author's abstract)

Krendel, E. S. 1952a
THE SPECTRAL DENSITY STUDY OF TRACKING PERFORMANCE. II. THE EFFECTS OF INPUT AMPLITUDE AND PRACTICE. — Jan. 1952. v+16 p. Franklin Institute. Philadelphia, Pa. (Contract AF 33(038)-10420); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-11, part 2 (RDO no. 694-39) (TIP U69416; ATI 186 688).
PB 108385

Quantitative information about human frequency response functions in the control of a piloted aircraft would provide a rational basis for stability and control criteria. Were the pilot a linear, time-invariant system, the ratio of the spectral densities of his output signal to his input signal would be the square of the transfer function describing the pilot. Using two subjects in a simple tracking task, the amplitude part of the frequency response has been computed for statistical inputs of two different mean amplitudes and for two different stages of practice. The foregoing conditions would, it was hoped, indicate whether a rough linear time-invariant approximation could be used to describe the tracker's behavior. The results indicate the need for further research, but they are not conclusive in themselves. (Author's abstract)

Krumm, R. L. 1952
CRITICAL REQUIREMENTS OF PILOT INSTRUCTORS. — Sept. 1952. v+18 p. American Inst. for Research, Pittsburgh, Pa. (Contract AF 33(038)-23183); issued by Air Training Command. Human Resources Research Center. Pilot Training Research Lab., Goodfellow Air Force Base, Tex. Technical report no. 52-1 (Project no. 508-016-0003) (TIP U25516).
PB 108225

Recent work in the area of flight instructor evaluation was systematically explored to serve as a basis for the development of a proficiency measurement device. Approximately 4600 separate reports of effective and ineffective behaviors of flight instructors were obtained from individual and group interviews conducted with cadets and student officers, student instructors, instructors, and supervisors at seven representative airfields in the Air Training Command. Identical behaviors were grouped together under a single statement summarizing the reported incident. The statements were combined by grouping similar behaviors, and a single phrase was developed which encompassed the various behaviors in the group. The total number of behaviors reported were reduced to 13 independent components of behaviors under three general areas. The classification was submitted to experienced pilots and educators for comments and suggested alterations. A small-scale evaluation of the relative importance of the various behavioral statements was achieved by administering the classification as a rating scale to experienced pilot instructors. The study indicates that the classification is a usable and useful description of the pilot instructor's job and will serve as a suitable basis for the development of an instructor proficiency evaluation device. (TIP abstract)

[Kryter, K. D.] 1952
[NOISE INTERFERENCE WITH SPEECH COMMUNICATION]. — In: Rosenblith, W. A. Summary of conference on problems of noise in industry. A.M.A. Arch. Indus. Hyg. and Occupational Med., v. 5 (2): 160-163. 1952. DSG

This is a review of a paper presented at the Conference on the Problems of Noise in Industry, Atlantic City, N. J., Apr. 23, 1951. Interference with speech communication was discussed as a function of noise intensity and frequency. Individuals with normal audiograms are alike in their ability to discriminate a signal in the presence of masking noise, but differ in their ability to withstand the effects of loud sounds. Differences were observed between the two ears of the same individual. Ear plugs were found to aid communication in the presence of loud noise.

Kryter, K. D. 1952a
NOISE AND BEHAVIOR. — In: Noise—causes, effects, measurement, costs, control, p. 80-85. Ann Arbor, Mich.: Univ. of Mich. Press, 1952.
DLC (RA772.N7M5)

The author reviews the effects of intensive noise on reaction time, learning, on the accomplishment of mental work, psychomotor tasks, and communication (speech, sign, radio, etc.) on the basis of literature data and of his own experiments. The following conclusions are reached: in general, noise does not have a marked detrimental effect on work performance; an easy task becomes automatized; with a difficult task the subject concentrates harder and ignores the noise; subjects adapt to a noisy environment without continuous annoyance. With regard to voice communication in industrial establishments, the effects of noise on efficiency will vary according to the role communication plays in each type of work.

Considering the problem of noise from an emotional or public-health angle, it is emphasized by the author that once the adaptation is made, there is no evidence of harm either of a physiological or of a psychological nature.

Kuhns, M. P. see Herrick, R. M., 1952

LaBarthe, P. see Grandpierre, R., 1952f

Laird, M. 1952
INSECTS COLLECTED FROM AIRCRAFT ARRIVING IN NEW ZEALAND DURING 1951. — Jour. Aviation Med., 23 (3): 280-285. 1952.
DLC (TL555.A1A4, v. 23)

An analysis is given of insects and other invertebrate animals (spiders, crab) collected on 111 airplanes which arrived at the airport of Auckland, New Zealand, during March to December, 1951. The insects were found in various parts of the airplane, including the outside of the fuselage (mainly moth eggs). Nine of the 25 orders of insects were represented in the collection; the most common forms were houseflies and blowflies, cockroaches, and ants. Some species were of medical significance as vectors of diseases (e.g., the mosquito, Culex annulirostris), other species of economic importance as agricultural pests.

Lalli, G. 1952
and B. Tagliamonte
[ELECTROPHORETIC STUDY OF THE BEHAVIOR OF THE SERUM PROTEINS IN RABBITS SUBJECTED TO ANOXIA] Studio elettroforetico sul comportamento delle sieroproteine in conigli sottoposti ad anossia. — Rivista di medicina aeronautica (Roma), 15 (3): 353-375. 1952. In Italian, with English, French, Spanish, and German summaries (p. 373-374). DSG

The serum proteins of rabbits exposed to a simulated altitude of 7,500 m. for 4 hours a day, over a period of 20 days, were investigated electrophoretically preceding and immediately following the first, tenth, and twentieth exposure. The protein fractions separated deviated in most instances only slightly (occasionally, however, markedly) from normal. Both, beta- and gamma-globulin showed a tendency to increase. A group of rabbits affected with scabies did not react to altitude exposure in any abnormal way.

Lamarche, M. see Arnould, P., 1952
Lambert, E. H. see Wood, E. H., 1952
Lancaster, W. H. see Sells, S. B., 1952

Lansberg, M. P. 1952
[STUDIES ON THE VALUE OF CUPULOMETRY TO OBTAIN AN OBJECTIVE AND REPRODUCIBLE MEASURE OF PREDISPOSITION TO MOTION SICKNESS] Onderzoek naar de waarde van de cupulometrische methode voor het verkrijgen van een objectieve en reproduceerbare maatsaf van de predispositie voor "motion sickness".— Aeromedica acta (Soesterberg, Netherlands), 1: 61-67. 1952. In Dutch, with English summary (p. 67). DSG

Cupulometry as an indicator of predisposition to motion sickness is an improvement over the turning chair (Barany) test in that it applies weaker stimuli which can be expressed in measurable units. Using cupulometry, the attempt has been made to establish a quantitative relationship between stimuli and degree of nausea. In critically analyzing the method, the author points out as one of its main shortcomings that it disregards to a great extent the psychological factors that play such an important part in motion sickness. However, the method may prove of advantage in combination with existing practices in the determination of proneness to motion sickness.

Larsson, L. J. 1952
[SENSORY ILLUSIONS IN INSTRUMENT FLYING] Sinnesvillor under instrumentflygning. — Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 1952 (2): 10-15. 1952. DSG

The functions of the vestibular apparatus in relation to orientation in space are outlined and demonstrated graphically in a number of diagrammatic illustrations.

Lassiter, L. W. see Hubbard, H. H., 1952
Lawler, A. see Ulett, G. A., 1952

Lawrence, J. H., 1952
R. L. Huff, W. Siri, L. R. Wasserman, and T. G. Hennessy
A PHYSIOLOGICAL STUDY IN THE PERUVIAN ANDES. — Acta medica scandinavica (Stockholm), 142 (2): 117-131. 1952. In English. DSG

The effects of high altitude were investigated on three groups of test subjects: Group I, consisting of 14 healthy medical students from Lima, Peru; Group II, made up of 11 normal natives from the region of Morococha (altitude, 14,900 feet); and Group III, consisting of 4 native miners from Morococha suffering from high-altitude polycythemia and pulmonary silicosis. The following tests were carried out: blood volume determination (by the radioactive-phosphorus tagging method); plasma iron analysis; and determination of the plasma-iron turnover rate (rate of plasma concentration of Fe^{59} as a function of time). From the findings obtained, the following conclusions were drawn: (1) the rise in red cell count and hematocrit during the onset of high-altitude exposure can be attributed to hemoconcentration; (2) tagging with Fe^{59} was found to be the most sensitive method for detecting changes in the rate of hematopoietic activity; (3) altitude polycythemia differs from polycythemia vera in that the spleen fails to enlarge and in the absence of thrombocytosis or leukocytosis; (4) there is no evidence of polycythemia vera among the natives acclimatized to high altitude; and (5) the fact that the iron turnover in the natives of Morococha decreased, 10 days after descent to sea level, is remindful of similar changes in aplastic anemia.

Lawrence, M. 1952
and E. G. Wever
EFFECTS OF OXYGEN DEPRIVATION UPON THE STRUCTURE OF THE ORGAN OF CORTI. — A. M. A. Arch. Otolaryngol., 55 (1): 31-37. 1952. DLC (RF1. A7, v. 55)

Cats were exposed to air with reduced oxygen content and the cochlear potentials created upon sound stimulation were recorded. When the air contained less than 4% oxygen, a gradual deterioration of the auditory functions set in. Four of the cats in various stages of anoxia were killed by injection of Maximov's solution and their cochleae studied histologically. The degeneration of the organ of Corti affected the various cell types in a definite succession: first the cells of Deiters, later those of Claudius, of Hansen, and finally the hair cells. The same mode of progressive degeneration was also found in normal cats after death.

Lawton, A. H. 1952
HUMAN FACTORS IN THE OPERATIONS AND DESIGN OF AIRCRAFT. — Jour. Aviation Med., 23 (3): 254-258, 306. 1952. DLC (TL555. A1A4, v. 23)

Human factors in aviation embrace three broad divisions: (1) aviation medicine, which familiarizes pilots with their equipment, safety measures, and preventive medical aspects; (2) human engineering, which analyses limitations of human response to the aircraft and its equipment; and (3) human resources which relate to selection, classification, aptitude measurement, training, and human relations, taking into the account the diversified nature of human beings. — Psychophysiological aspects of noise, vibration, use of pressurized cabins, use of ejection seats and all kinds of protective equipment, and the impact of speed are discussed. Animal experiments have a great value in furthering research but ultimately each device, method, and principle has to be tested by "human guinea pigs".

Lazarus, R. S. see Deese, J., 1952

Lecznar, W. B. 1952
A VALIDATION STUDY OF THE AIRMAN CLASSIFICATION BATTERY AC-IB FOR TRAFFIC ANALYSIS TRAINING. — Air Training Command. Personnel Research Lab., Lackland Air Force Base, Tex. Technical report no.

52-7, Nov. 1952. 15 p. (Project no. 503-001-0001; AD 3243). PB 108699

A preliminary analysis was made of existing selection measures for traffic analysis training. A special test proposed as an improved selection instrument was administered to persons who had already been screened on the airman classification battery. In 58 cases a reduction in the elimination rate of students could be achieved by raising the requirement for selection to a technician specialty aptitude index of 8. (AD abstract)

Lederer, L. 1952
WHAT PRICE PRESSURIZATION? — Amer. Aviation, 16 (2): 30. 1952.
DLC (TL501.A675, v. 16)

At altitudes of 10,000 ft. and above, the oxygen uptake of the blood through the lung is rather limited, resulting often in hypoxemia. For this reason the modern pilot has become very oxygen-conscious and regulations call for application of supplementary oxygen by mask when flight is performed at 8,000 or 10,000 ft. altitude for 30 minutes or more. — In the pressurized cabins, the pressure differential varies according to the discrepancy between the two altitudes: most of the larger planes can maintain a cabin altitude of approximately 8,000 ft. while flying at 20,000-22,000 ft. The inconveniences suffered on a non-pressurized aircraft (e.g. cold and deafness on descent), are cut by at least 50% on a pressurized plane.

Lee, R. A. see Doyle, J. T., 1952a

LeHalle, P. 1952
[SPECIAL PHYSICAL EDUCATION FOR FLYING PERSONNEL] L'éducation physique spéciale du personnel navigant. — Annales belges de médecine militaire (Liège), 105 (1-2): 39-45. 1952. In French. DSG (W1 AN3092, v. 105)

Special physical and psychological requirements for pilots are listed and outlined, such as: neuromuscular control, alertness, reaction speed, coordination of actions and movements, and resistance to anoxic conditions. Aspects of preparation and training related to these factors are discussed in general terms.

Leibowitz, H. see Brown, John L., 1952
Leikind, M. C. see Weiner, J., 1952
Leininger, T. C. see Gulley, W. E., 1952a

Lemaire, R. 1952
[THE ADAPTATION OF THE FLYING PERSONNEL TO THE TROPICAL CLIMATE OF WEST AFRICA] L'adaptation du personnel navigant aux climats tropicaux de l'Ouest Africain. — Médecine aéronautique (Paris), 7 (4): 507-515. 1952. In French. DLC (TL555.M394, v. 7)

Analyzes the climatic conditions of French West Africa in detail and discusses physiological acclimatization to these conditions. During the process of acclimatization, pilots stationed in West Africa generally experience no significant disturbances. After reaching a state of acclimatization, however, more serious conditions may develop gradually: because of vasodilation, a great amount of blood is driven towards the extremities, thus reducing the blood supply to the major organs; flying at high altitude and again descending to the tropical climate exerts a strain on the thermoregulatory mechanism; excessive sweating induces metabolic disorders which may affect the nervous system and thus reduce the flying ability; resistance to anoxemia decreases due to constant inhaling of humid air. It appears that adrenal function has to balance the effects of both the climate and flying. Manifestations of fatigue set in earlier in pilots than in other subjects living in the tropics. — In the selection of pilots for the Tropics, emphasis should be placed on the examination of the neurovegetative and circulatory systems. Reactions to sweating should be tested in "sweating chambers". A diet poor in lipids but rich in vitamins should be given. Having recourse to sports in a moderate way has proved to be of excellent physical and moral value.

Lemaire, R. 1952a
and C. Bousquet
[VALUE OF EXAMINATION OF THE VEGETATIVE NERVOUS SYSTEM BY MEANS OF THE FLACK TEST] Valeur de l'éxploration du système neurovégétatif a l'aide du test de Flack. — Médecine aéronautique (Paris), 7 (1): 31-32. 1952. In French. DLC (TL555.M394, v. 7)

The Flack test and the orthostatic test were applied to 50 aviators and their oculocardiac reflexes were examined. The findings of the authors' and those of the original Flack test were not identical; discrepancies are discussed in detail.

Lemaire, R. see also Grandpierre, R., 1952c, 1952e, 1952f, 1952g

Lemley, J. M. 1952
and G. R. Meneely
EFFECTS OF ANOXIA ON METABOLISM OF MYOCARDIAL TISSUE. — Amer. Jour. Physiol., 169 (1): 66-73. 1952.

Metabolic reactions were studied in homogenized myocardial tissue removed from rats which had been killed by prolonged anoxia. The oxygen uptake of tissue from the test animals was found to be only one half that of the controls. Manometric estimation of lactic acid dehydrogenase gave no evidence of any difference in the activity of this enzyme in the myocardial tissue of anoxic rats and controls. A reduction was observed in coenzyme I (17%) and in cytochrome (30%). The oxygen consumption of homogenized myocardial tissue from anoxic rats could be restored to normal by supplementation with an aqueous extract of boiled hearts from normal rats. A hypothesis regarding the physiological mechanism of these findings is advanced in the light of similar studies previously undertaken. It is pointed out that the decrease in oxygen consumption of anoxic myocardial tissue was not caused by

destruction of the respiratory enzymes themselves, but rather by a deficit of other factors essential for normal activity.

Lett, J. E. 1952
NASAL VASOCONSTRICTION IN FLYING. — U. S. Air Force Medical Service Digest, 3 (5): 20. 1952. DSG (W2 A403u, v. 3)

Adequate nasal-cavity ventilation through the Eustachian tube and the ostia of the sinuses can be voluntarily maintained during flight by healthy persons. In case of acute upper respiratory infections, however, removal of a flyer from flying duty becomes mandatory. Where, due to emergency conditions, discontinuation of flying duty is precluded, application of vasoconstrictor drugs is advised. However, drugs causing secondary engorgement following constriction or promoting hyperplasia of the nasal tissues should be avoided. The extreme dryness of the air in the upper altitudes constitutes an additional factor of nasal obstruction, causing excessive mucus secretion in the nasal passages and discomfort during descent. "Rhinalgan" (containing desoxyephedrine saccharinate, 0.05% weight per volume in an isotonic aqueous solution of lauryl-ammonium saccharin, 0.20%) was found to be an effective nasal vasoconstrictor, free of side reactions. The use of the so-called "coryza" tablets (atropine and ephedrine) has been discontinued because of their various side effects (gastric distress, tachycardia, lack of salivation, insomnia, and nervousness).

Lett, J. E. 1952a
EAR-NOSE-THROAT. — U. S. Air Force Medical Service Digest, 3 (9): 26-29. 1952. DSG (W2 A403u, v. 3)

Practical aspects of otolaryngology in the Air Force are briefly discussed, with particular regard to the following points: incidence of ear-nose-throat diseases; use and effectiveness of antihistaminic drugs; treatment of otitis externa; advisability of the use of antibiotics; and tolerance of noise.

Levy, J. see Binet, L., 1952c

Lewis, B. M. 1952
and R. Gorlin
EFFECTS OF HYPOXIA ON PULMONARY CIRCULATION OF THE DOG. — Amer. Jour. Physiol., 170 (3): 574-587. 1952. DLC (QP1.A5, v. 170)

Simultaneous determinations of pulmonary arterial pressure, left atrial pressure, and cardiac output were carried out in dogs during the breathing of gas mixtures containing from 10% to 2.5% oxygen. Blood samples were withdrawn during the experiment from the femoral and pulmonary arteries and the percentage of oxygen saturation was determined. Pulmonary arterial pressure was found to rise at a steady rate as soon as anoxia became appreciable (arterial oxygen saturation of about 80%). The left atrial pressure remained constant until a severe stage of hypoxia (oxygen saturation, 15%). The cardiac output did not change considerably from control values until an oxygen saturation of 55% was reached; it increased between 55% and 40%, remained constant up to about 20%, and decreased again until oxygen saturation was down to 8%. Both increases and decreases of pulmonary vascular resistance were found in response to hypoxia (when arterial oxygen saturation exceeded 55%, pulmonary vasoconstriction usually occured raising the level of pulmonary vascular resistance).

Lewis, B. M. 1952a
and R. Gorlin
EFFECTS OF GRADED HYPOXEMIA ON THE PULMONARY CIRCULATION OF THE DOG. II. MODERATE HYPOXEMIA. — Federation Proceedings, 11 (1[I]): 93. 1952. DSG

Anesthetized dogs breathed mixtures containing 10% oxygen for periods lasting from 20 minutes to 8 hours. The arterial oxygen saturation varied from 55 to 79%. The cardiac output equaled that of the controls at any anoxic stage. The oxygen consumption and arterio-venous oxygen difference remained almost constant. The pulmonary arterial pressure increased little, while the left arterial pressure decreased. The pulmonary vascular resistance increased markedly in direct proportion to the length of exposure to anoxia. A dog exposed to anoxia for 7 hours and subsequently breathing room air for 3 hours, showed a fall in pulmonary vascular resistance.

Lewis, R. B. 1952
HIGH ALTITUDE HYPOXIA: PHYSIOLOGY AND PATHOLOGY. — U. S. Navy Medical News Letter, 19 (6): 3-4. 1952. DSG (W1 UN598, v. 19)

Autopsy findings on 75 World War II casualties, with hypoxia as the probable cause of death, revealed pathological alterations which may be divided into the following categories: (1) vascular changes characterized by engorgement of systemic veins and marked passive congestion, edema, and hemorrhage into internal organs; (2) vacuolar changes in various internal organs, especially in the liver and in the heart; (3) increased hypertrophy of the macrophages of the leptomeninges and extravasation of lymphocytes into the perivascular spaces; and (4) acute ganglion cell changes within the brain, most frequent and severe in the hippocampus gyrus of the cerebral cortex. To resuscitate flyers who have succumbed to high altitude anoxia, breathing of a mixture containing 5-10% carbon dioxide and 95-90% oxygen is recommended. This mixture should be administered with an intermittent positive-pressure resuscitator at a peak pressure of 50-20 cm. H_2O above the ambient pressure (40-60 liters per minute). The theory of high altitude anoxia is briefly summarized.

Ley, W. 1952
A STATION IN SPACE. — In: Across the space frontier, p. 98-117. Ed. by C. Ryan. New York: Viking Press, 1952. DLC (TL790. R9)

Methods of constructing and operating a man-made satellite, which would rotate around the earth at a distance of 1,075 miles, are outlined in popular form. Ways of supplying oxygen (oxygen-helium mixtures would be preferable to oxygen-nitrogen mixtures), food, and water (in form of ice), and methods of disposing of (and salvaging) refuses are described. The space station, which would be in the shape of a two-spoked wheel 250 feet in diameter, would create its own gravitational field by spinning around its hub (once every 22 seconds). It would be provided with "meteor bumpers" and layers of self-sealing material to minimize damage by meteorites. Temperature control would be effected by means of shutter-like blinds, adjustable to proper amounts of heat absorption. Erection of a space station, as suggested, is within the reach of present-day engineering and would be the first step toward the exploration of space.

Lichte, W. H. 1952
SHAPE CONSTANCY: DEPENDENCE UPON ANGLE OF ROTATION; INDIVIDUAL DIFFERENCES. — Jour. Exper. Psychol., 43 (1): 49-57. 1952. DLC (BF1. J6, v. 43)

Shape perception tests were carried out on 50 university students each serving in two one-hour sessions. The subject rotated a square plate on a vertical axis until it appeared to him equal in shape to a given rectangle. Four rectangles of varying widths were used and each student made a total of 52 settings for each rectangle. The following results were reached: When the angle of rotation was increased, the index of constancy (Brunswick ratio, cf. E. Brunswick, Zeitschrift für Psychologie, 109: 40-115, 1929) decreased considerably. The variability of settings was greater for the large rotation angles (narrow rectangle) than for the small ones (wide rectangle). The change of the angle of rotation did not affect the variability of the Brunswick ratio. The degree of constancy varied greatly with the individual angles, also with the same individual from session to session and within sessions. For any given individual and situation the absolute amount of regression to the real shape of the object was limited.

Lichtenberg, J. 1952
and F. Zeman
[TRANSPORTATION OF PATIENTS WITH SPECIAL REFERENCE TO AVIATION] Léčebne-odsunove zajištóvaní raněných se zvlástním zřetelem k možnostem letecké dopravy. — Praktický lékař (Praha), 32 (1): 2-6. 1952. In Czech. DSG

The following aspects of transportation of patients by airplane are discussed: (1) causes of injury or death of patients during air transportation; (2) complications that may develop during transportation; (3) medical care of patients during flight; (4) priority in selecting patients for air transportation; (5) indications and contra-indications for transportation of patients suffering from shock; (6) criteria for selecting means of transportation; and (7) care of patients after leaving the transport plane.

Lightfoot, R. B. see Gordon, M. A., 1952a

Lincoln, R. S. 1952
and Karl U. Smith
SYSTEMATIC ANALYSIS OF FACTORS DETERMINING ACCURACY IN VISUAL TRACKING. — Science, 116 (3008): 183-187. Aug. 22, 1952. DLC (Q1. S35, v. 116)

An apparatus is described, designed to determine the degree of precision in visual motor tracking. Its basic components are as follows: (1) a target-cursor display; (2) a hand control system; (3) a universal tracking control system; (4) a target-course generator system; and (5) an error recording and summating device. Experiments conducted with this apparatus revealed data on precision of tracking, on optimum ratios between hand wheel and cursor motion for different types of tracking, and on the effect of learning and of target characteristics on component movements.

Lindenberg, P. 1952
and E. P. Fowler
GENERAL PRACTICE, INDUSTRIAL, MILITARY, AND SCHOOL AUDIOMETRY. — New York State Jour. Med., 52 (23): 2897-2902. 1952. DSG

Various hearing tests are described and evaluated. The author recommends the use of a pure-tone audiometric technique as a routine test, in preference to the quantitatively useless spoken-word whisper test.

Lins, W. see Mendes, M. F., 1952c; Villalonga, J., 1952

Lippert, S. 1952
and M. M. Miller
A METHOD FOR EVALUATING AIRCRAFT ACOUSTICAL COMFORT. — Jour. Aviation Med., 23 (1): 54-66. 1952. DLC (TL555. A1A4, v. 23)

The subjective discomfort due to noise varies with the pitch of the noise, higher frequencies causing more discomfort than lower frequencies of the same intensity. The authors present graphs plotting the noise levels of various airplanes (in decibels) against the frequency spectrum (in octaves). By giving the various octaves different weights (as determined empirically), they arrive at a one-number "acoustical comfort index" as a measure of subjective acoustical comfort derived from physical noise characteristics.

Livingston, R. B. see Burr, H. S., 1952
Loevinger, J. see DuBois, P. H., 1952

Lombard, C. F. 1952
THE USAF FLYING SAFETY PROGRAM. — Directorate of Flight Safety Research, Norton Air Force Base, Calif. Publication no. M-7-52, March 3, 1952. 17 p. (TIP U21927).
UNCLASSIFIED

In an address presented before the Aeronautical Section of the thirteenth annual Safety Conference held at Atlanta, Georgia, on March 3, 1952, the author outlined the organization and activities of the Directorate of Flight Safety Research at Norton Air Force Base, California. The work of the Directorate is carried out by the following major divisions: (1) investigation and safety engineering; (2) medical safety; (3) records and statistics; and (4) safety education. Aircraft accidents are investigated by technical specialist teams, and reports are evaluated and statistically analyzed. Concrete examples of such investigations and the ensuing accident histories are presented. The educational functions of the Directorate of Flight Safety comprise, among others, the following activities: orientation and training of flight safety officers; establishment of flight safety as an academic subject in civilian universities; publication of safety education publications (such as "Flying Safety", "Aircraft Accident and Maintenance Review", etc.). The effectiveness of the US Air Force flying safety program has resulted in a decrease in the major aircraft accident rate. During 1951, the Air Force had the lowest major accident rate in its history (33 per 100,000 hours flying, as compared to 36 for 1950).

Lombard, C. F. 1952a
O_2 AND YOU. — Flying Safety, 8 (6): 10-13. 1952.
DNACA

Five case histories involving failures of oxygen equipment in various types of planes are discussed. Methods of preventing breakdown of oxygen supply and checking equipment and masks are outlined.

Lo Monaco [Croce], T. 1952
[SOME PROBABLE PHYSIOPATHOLOGICAL PHENOMENA IN MAN DURING FUTURE INTERPLANETARY FLIGHTS] Alcuni probabili fenomeni fisio-patologici dell'uomo durante i futuri voli siderali. — Rivista di medicina aeronautica (Roma), 15 (1): 3-12. 1952. In Italian, with English, French, Spanish, and German summaries (p. 12).
DLC (TL555.A1R5, v. 15)

Physiopathological aspects of interplanetary flight are discussed, falling in three main categories: (1) changes in speed or direction of a moving body exert forces on the organism which are tolerated best if they are of short duration; (2) reduction of the apparent weight beyond the zone of graviation would affect the labyrinthic rather than the cardiovascular system and would interfere with muscular coordination; and (3) problems of the environment include maintenance of air supply, temperature, and food, and avoidance of cosmic radiation. Space medicine cannot, at present, give any assurance as to the survival of humans in a spaceship.

Lo Monaco [Croce], T. 1952a
[AIR TRANSPORTATION OF THE SICK AND WOUNDED FROM THE COMBAT LINES: CONCLUSIONS DRAWN FROM THE PRESENT WARS IN THE FAR EAST] Il trasporto aereo di ammalati e feriti dai fronti di battaglia; insegnamenti delle attuali guerre in Estremo Oriente. — Rivista di medicina aeronautica (Roma), 15 (3): 400-410. 1952. In Italian, with English, French, Spanish, and German summaries (p. 410).
DSG

The usefulness and advantages of helicopters as a means of evacuation in war are analyzed: the morale of the wounded is maintained by helping them without delay; there is economy in time, personnel, medical material, and transportation. Evacuation of wounded is possible from mountain areas which are not accessible to regular aircraft. International regulations should be established to protect the safety of evacuation helicopters.

Long, E. R. 1952
and L. S. Reid
FACTORS DETERMINING THE LEGIBILITY OF LETTERS AND WORDS PRINTED IN "DOT" PATTERNS WITH PURE BLACK AND WHITE WHEN THE PATTERNS ARE DEGRADED IN VARYING AMOUNTS. — Apr. 1952. 4+23 p. Univ. of Virginia, Charlottesville (W33(038) ac-21269); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. Technical report no. 5922 (RDO no. 694-37) (AD 1144).
PB 108671

The effects of the various types and degrees of stimulus change on recognition or legibility of letter patterns was investigated by systematically varying the following factors: (1) number and size of elements (35 and 140 elements), (2) types of degradation (omission, addition, and omission plus addition), (3) degree of degradation (0, 10, 30, and 60%), and (4) viewing brightness (6.5 and 87.5 millilamberts). All patterns were printed in black and white. The degree of letter recognition was inversely proportional to the degree of degradation. The number of correct recognitions increased directly with the number elements of equal-area matrices. Increasing the viewing brightness had no significant effect. (AD abstract)

Long, E. R. 1952a
and L. S. Reid
FACTORS DETERMINING THE LEGIBILITY OF LETTERS AND WORDS PRINTED IN "DOT" PATTERNS WITH DIFFERENTIAL BRIGHTNESSES OF THE PATTERNS PROPORTIONAL TO THE AMOUNT OF DEGRADATION. — Apr. 1952. 4+25 p. Univ. of Virginia, Charlottesville (Contract W33(038)ac-21269); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. AF Technical report no. 5923 (RDO no. 694-37) (AD 1145).
PB 108672

It was the immediate purpose of this study to determine the degree to which letters printed in "gray scale" (i.e., printing signal and noise ele-

ments in brightnesses proportional to their respective intensities) were susceptible to the various types and degrees of degradation previously studied. The following are tentative findings: (1) stimulus legibility was again found to be reduced by all types of degradation (element omission, addition, and simultaneous addition plus omission); (2) loss of intelligibility may be reduced either by increasing the number of matrix elements (from 35 to 140), or by changing from letters printed in pure black and white to those utilizing the gray scale; (3) statistical analysis of the data indicates that simultaneously combined addition of spurious elements and omission of signal elements reduces stimulus legibility disproportionately more than does either addition or omission alone. (From the authors' abstract)

Long, W. F. see Harding, F. D., 1952

Lublin, A. 1952
["PATHOMORPHOSIS" OF DISEASES DURING LIFE AT HIGH ALTITUDES] Pathomorphose von Krankheiten beim Leben in grosser Höhe. — Zeitschrift für klinische Medizin (Berlin), 149 (6): 640-656. 1952. In German. DSG

The pathological effects of high altitude are described, chiefly on the basis of personal observations made by the author during his stay in La Paz, Bolivia (altitude 3,700 m.). Acclimatization to this altitude was found to be more rapid if the arrival took place by plane rather than by railway (a 24-hour trip). An increase in erythrocyte number is almost immediate. While non-strenuous work does not cause as much discomfort as is generally assumed, any form of infectious disease leads to attacks of alternating dyspnea and polypnea and other disturbances, and transfer to lower regions is indicated. Cardiac infarcts are frequent among non-natives, even at younger age. Arterial hypotension is common (blood pressure values of 82/45-70/50 mm. Hg were observed by the author). The high incidence of thromboangiitis obliterans (Buerger's disease) and of thrombophlebitis could be correlated with the altitude. Erythrocyte counts carried out at La Paz revealed average values between 5.5 and 6.5 millions per cubic millimeter. It appears that humans suffer more from the effects of polyglobulism after return from higher to lower altitudes than vice versa. Cases of anemia are generally retarded or entirely stopped. Pernicious anemia is almost not found. Lymphocytosis, however, is a normal occurrence, with lymphocyte values averaging 41-45%. The case of a pilot, in which attacks of gout were correlated with flights involving extreme altitude differences, is reported.

Lucas, B. G. B. 1952
and D. H. Strangeways
THE EFFECT OF INTERMITTENT ANOXIA OF THE BRAIN. — Jour. Pathol. and Bacteriol. (London), 64 (2): 265-271. 1952. DSG

In Experiment I, 19 pairs of guinea pigs were subjected to anoxia by being placed under bell jars through which nitrogen circulated, until they had been unconscious for about 30 seconds. This procedure was repeated twice daily for 30 days. Beginning with the 11th day, one pair was eliminated from the experiment each day, one guinea pig being killed with nitrogen, the other allowed to remain without further treatment for 10 days. — Experiment II consisted of intermittent exposure of 10 pairs of guinea pigs to nitrogen, completing 60 exposures in 8 hours. Again 5 animals were killed immediately, the other 5 allowed to live 10 more days.

The brains of the experimental animals and of untreated controls were examined histologically. Of the guinea pigs treated in Experiment I, only 2 showed changes due to anoxia: edematous cells in the anterior part of the hippocampus, changes in the granular layer of the cerebellar median lobe, and large pericellular spaces around the Purkinje cells. — In Experiment II, no changes were detected in 7 animals; the remaining 3 showed chromatolytic changes in some cells. The animals which lived after the exposure exhibited neurological signs (lack of appetite, lethargy).

It is concluded that, under the conditions of the experiment, repeated nitrogen asphyxia for 30 days does not have a marked histologically demonstrable cumulative effect on the brain of the guinea pig.

Lucas, J. D. 1952
AN ANALYSIS OF INSTRUCTOR DIFFERENCES IN THE USE OF THE STUDENT PERFORMANCE RATING SCALE IN FLIGHT TRAINING. — Air Training Command. Human Resources Research Center. Aircraft Observer Training Research Lab., Lackland Air Force Base, Tex. Research bulletin no. 52-6, Feb. 1952. v+10 p. (Project no. 506-006-0005; TIP U21930).
PB 106751

A study was conducted on instructors' uses of rating scales for students in the radar and visual-bombing phases of training. Although the average performance ratings given by different instructors did not differ markedly, significant differences occurred among instructors in the range of scores given. Some instructors tended to spread the grades out over the available range, while others tended to put all of the grades within a limited range each side of average. Instructors who exhibited one or the other of these tendencies on one item of the 10-item rating scale tended to exhibit the same tendency on all items. Recommendations are made for: indoctrination of instructors in the use of the rating scale, continuous checking of results to insure that differences in instructor grading practices do not decrease student-evaluation accuracy, and possible translation of instructor ratings into standard scores. (TIP abstract)

Luccioni, H. see Malmejac, J., 1952a

Luft, U. [C.] 1952
PHYSIOLOGICAL LIMITATIONS IN CABIN ENVIRONMENT AND HUMAN ADAPTATIONS. —

In: Physics and medicine of the upper atmosphere: a study of the aeropause, p. 567-574. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico Press, 1952.
DLC (RC1050. U5, 1952)

Mental and physical performance can be maintained for an indefinite period of time at 1/4 atmosphere (3.7 psi, or 190 mm. Hg air pressure), provided that the inert gases in the inspired air are replaced by oxygen. The toxic effects of oxygen are eliminated at all altitudes above 15,000 ft. Mountain climbers have withstood heavy physical exertion at altitudes up to 28,000 ft. following altitude acclimatization. Thus, acclimatization plus the added benefit of pure oxygen breathing would enable a special crew to operate in a cabin under little more than 2 psi (45,000 ft.). Such altitude acclimatization would require exposure over a period of 6-8 weeks. Experiments have shown that a gradual increase in carbon dioxide of 7-10 mm. Hg per hour is tolerable for 3-4 hours, and even for longer periods if the body is at rest. Two types of physiological effects of explosive decompression may be distinguished: (a) those due to changes in total pressure or mechanical phenomena (expansion of free gases in the body cavities), and (b) metabolic effects caused by the loss of oxygen and carbon dioxide pressures. Pulmonary lesions are liable to occur when the intrapulmonary pressure difference exceeds 100 mm. Hg and the lungs are extended beyond a critical limit. Protective garments may reduce this hazard. No evidence has been found that gases absorbed in body fluids are suddenly liberated in explosive decompression.

Luft, U. C. 1952a
and W. K. Noell
ANOXIC SURVIVAL TIME OF CEREBRAL ACTIVITY IN SUDDEN EXPOSURE TO HIGH ALTITUDES. — Amer. Jour. Physiol., 171 (3): 745. 1952. DLC (QP1. A5, v. 171)

Anesthetized monkeys breathing oxygen were explosively decompressed from a level of 200 mm. Hg to 39-90 mm. Hg. Below 50 mm. Hg, spontaneous electrical activity of the brain disappeared in 29 seconds; the striate response to light flashes in 39 seconds; the electro-positive response of the retinogram in 45 seconds; and the responsiveness of the corpus striatum to the electrical stimulation of the geniculate body lasted for 3 to 5 minutes. — The thresholds below which survival time became constant regardless of barometric pressure showed also discrepancies: for the spontaneous brain waves this happened at pressures below 60 mm. Hg, for the cortical response to light stimulation below 50 mm. Hg, and for the reduction in the retinogram below about 70 mm. Hg.

Luft, U. C. see also Boothby, W. M., 1952
Lukas, C. A. see Schaefer, K. E., 1952, 1952a

Lund, P. 1952
[CONTAINERS FOR LIQUID OXYGEN] Förvaringskärl för flytande syre. — Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 1952 (2): 8-10. 1952. In Swedish. DSG

A liquid oxygen container, designed by the Aeromedical Laboratory at Lund and manufactured in Sweden for special use in aviation, is described. The bottle is made of stainless steel and the inner part of the mantle is lined with laminated aluminum. The heat-transfer coefficient of the container compares very favorably with those of containers now in use elsewhere.

Lundberg, U. 1952
[A FATIGUE INVESTIGATION AT THE F-7 UNIT] En trötthetsundersökning vid F 7. — Meddelanden från flyg- och navalmedicinska nämnden, 1952 (3): 6-7. 1952. In Swedish. DSG

The case of an experienced pilot of the Swedish air force is reported, who showed abnormally low blood-sugar levels during and after a routine flight. A physical checkup revealed a positive sugar reading in the urine but no other abnormalities. Normal values were obtained in a sugar-tolerance test and in an intravenous glucose test. The subject was then given glucose per os (1 g. glucose per kilogram body weight) and sent on short (1/2-hour) flights. Between flights urine samples were taken, which revealed an elevated glucose level at the end of the day. The same test was repeated the following day on the ground, combined with heavy physical exercise. Again a lowering of blood sugar was observed, but far less pronounced than after flying. For reasons of comparison, similar sugar-tolerance tests were carried out on the entire crew of a transport plane. One crew member (a mechanic who did not perform any physical work) was affected with hypoglycemia. Predisposition to hypoglycemia could not be related to constitutional factors, but dietary factors seem to have a strong influence on occurrence and degree of the abnormality. Emotional factors, too, come into play.

Lundberg, U. 1952a
[ABSENCE FROM FLYING BECAUSE OF SICKNESS] Frånvaro från flygning på grund av ohälsa. — Meddelanden från flyg- och navalmedicinska nämnden (Stockholm), 1952 (3): 7. 1952. In Swedish. DSG

A method of recording and classifying cases of sickness in the Swedish air force is described. A large number of those reporting sick are not recorded in the medical files, as reports are made to immediate superiors only. Since many of these cases (usually presented as mild upper respiratory infections) originate from deeper causes of a psychological nature (distaste of flying, anxieties, etc.), their study and observation is of particular interest.

Lundgren, N. P. V. see White, C. S., 1952

Luria, L. 1952
[SYSTEMATIC INVESTIGATION OF THE

ORTHO-CLINOSTATIC CARDIAC REFLEX ON THE PLAIN AND IN THE MOUNTAIN] Richerche sistematiche sul riflesso cardiaco orto-clinostatico in pianura e in montagna. — Bolletino della Società italiana di biologia sperimentale (Napoli), 28 (8-10): 1662-1663. 1952. In Italian. DSG

The heart rate was determined daily for 14 months in a 27-year-old healthy male subject adapted to the mountain climate. The tests were conducted on the plain and on the mountain at various altitudes. On the plain, the pulse rate in the standing position was 64-88 per minute (average, 74); in the lying position 52-78 per minute (average, 62). In the test conducted at various altitudes, the following pulse rates were obtained: altitude of 1000-2000 m., standing 70-88, lying 60-78; 2000-3000 m., standing 74-88, lying 72-78; and 3000-4000 m., standing 80-96, lying 76-84 per minute.

Lushington, M. L. see Bowen, H. M., 1952
Lyon, V. W. see Poe, A. C., 1952

Maag, C. H. 1952
and J. T. Blair
EXPRESSED REASONS FOR ENTERING THE NAVAL AVIATION TRAINING PROGRAM. — Naval School of Aviation Medicine, Pensacola, Fla. Memorandum report no. 4, April 28, 1952 (TIP U23377). UNCLASSIFIED

A randomly selected group of 276 cadets were asked to reply anonymously as to why they entered the Naval Air Training Program. The responses were subjected to a content analysis, and frequencies of expressed reasons were determined. The results indicated that the majority of cadets joined the program (1) to satisfy an interest in aviation (35.14%), (2) to avoid other military service (34.42%), and/or to receive a commission (15.57%). The latter two reasons are considered indicative of insufficient interest in flying and may contribute to the reasons for withdrawing from the program. Means suggested for reducing the attrition include (1) development of procedures to screen those motivated toward aviation or to eliminate those who are not and (2) enhancement and maintenance of the student's motivation toward the program after he is in. (TIP abstract)

Maag, C. H. see also Poe, A. C., 1952a

MacCarty, E. S. 1952
IMPROVED PASSENGER COMFORT THROUGH THE APPLICATION OF AIRLINE EXPERIENCE TO AIR CONDITIONING SYSTEM DESIGN. — S. A. E. Preprint, no. 758, 7 p. 1952. NNSAE

Experience has shown that, in order to secure reasonably comfortable airplanes, it is necessary to provide for (1) control of cabin pressure and of rate of cabin-pressure change; (2) temperature control; (3) maintenance of a relatively high total ventilation rate (about one to two pounds of fresh air per minute); (4) control of the direction of air flow in the occupied areas; and (5) uniform temperature distribution in the passenger compartment. For the purpose of illustration, the air-conditioning system of a Martin-404 aircraft is described in detail.

McCarthy, G. B. see Van Liere, E. J., 1952

McClanahan, E. C. 1952
RATE-RERATE RELIABILITY OF THE MILITARY APTITUDE RATING FORM IN USAF OFFICER CANDIDATE SCHOOL. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. PERS 52-52, Dec. 1952. 3 p. (Project no. 503-002-0005; AD 7952). UNCLASSIFIED

Three aptitude ratings of Officer Candidate School (OCS) members were obtained during the eight, sixteenth, and twenty-second week of training. The first rating consisted of a weighted composite of peer, upperclassmen, and tactical officer ratings; the other two ratings consisted of an equally weighted composite of peer and tactical officer ratings. The three sets were in fair agreement with each other (from 0.74 to 0.87) and compared almost equally with the final adjusted form. The ratings were considered sufficiently reliable through the time span to provide estimates of OCS performance. The progressive increase in the mean scores from rating 1 to 3 is discussed. (AD abstract)

McClanahan, E. C. see also Tupes, E. C., 1952d

[McCleary, R. A.] 1952
HOW MUCH WORK CAN FRIGID DIGITS DO? — Aviation Week, 56 (3): 38. Jan. 21, 1952. DLC (TA501.A8, v. 56)

Cold room tests are being conducted by Lt. Robert A. McCleary, research psychologist at the USAF School of Aviation Medicine, Randolph, Texas, with the objective to measure manual performance in extreme cold. A subject dressed in standard USAF Arctic garb attempts to open a wooden box roughly the size of a tool chest with a lid fastened by bolts and lockwire. The time necessary to do the job, skin temperatures, personal reactions, and comments of the subject are recorded and correlated to obtain an index of cold-weather performance.

[McFarland, R. A.] 1952
AIRPLANE ACCIDENTS AND AGE OF PILOTS. — Jour. Amer. Med. Assoc., 149 (11): 948. Mar. 15, 1952. DLC (R15.A48, v. 148)

Advanced age of pilots is no contributing factor in airplane accidents. A study of 59 fatal airplane accidents during the last 15 years showed that most of the accidents occurred during the first three hours of flight, when fatigue could be discounted. At present, 1,400 flyers holding airline certificates are between 40 and 50 years old.

Longer experience and more mature judgement compensate for any corrigible physical defects, e. g., presbyopia.

McGraw, J. L. 1952
and J. M. Enoch
CONTACT LENSES: AN EVALUATION STUDY. — Army Medical Research Lab., Fort Knox, Ky. Report no. 99, Oct. 10, 1952. 61+88 p. (AMRL Project no. 6-64-12-028, Subtask S-9; AD 1544). UNCLASSIFIED

Contact lenses and spectacles were compared to determine their relative merits and applications. The contact-lens types studied were: (1) a plastic, fluid, corneal-scleral design; (2) a plastic corneal design; (3) a plastic, ventilated, fluidless corneal-scleral design, and (4) a glass, ventilated, fluidless corneal-scleral design. The fluidless, ventilated lens proved superior to either the fluid or corneal type. The plastic lens appeared to offer greater protection of the eye since the lens is not easily broken. The major objection to plastic is attributed to poor wetting properties. In general, the contact lenses offer advantages in military field activities but are not superior in performance to spectacles in routine and clerical work. Contact lenses appear particularly advantageous for use in inclement weather, arctic duty, swimming, and violent activity. Corneal clouding is no longer a problem with the newer designs. (AD abstract)

McGraw, J. L. see also Alluisi, E. A., 1952

McIlnay, O. F. 1952
RECENT ADVANCES IN AVIATION MEDICINE. — Jour. Amer. Osteopath. Assoc., 52 (2): 123-125. 1952. DLC (RZ301. A6, v. 52)

Developments in the field of aviation medicine during the last decade are briefly reviewed. Among the basic problems still in the process of being studied, the following are the most important: selection of pilots and crew; visibility from the airplane; cabin temperature and pressure regulation; anti-g equipment; noise and vibration; cosmic radiation; meteoric collision; escape mechanisms; and organization of evacuation services.

McIntosh, B. B., 1952
J. L. Milton, and E. L. Cole
PILOT PERFORMANCE DURING EXTENDED PERIODS OF INSTRUMENT FLIGHT. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. AF Technical report no. 6725, May 1952. vii+42 p. (RDO no. 694-34) (TIP U24470). UNCLASSIFIED

Each of three pilots flew a C-47 aircraft for 10, 15, and 17 hours. Equipment installed in the airplane recorded the time during which flight indicators were kept within tolerance limits, and the variations of indicators and control positions. Addition, illusion, and reading-comprehension tests were given before, during, and after the 10-hour flight; pilot reaction time to a signal light was taken during the 15-hour flight, and an alertness indicator operated during the 17-hour flight. The time-within-tolerance results indicated as high a performance ability for both precision maneuvers and straight, level flights after 10, 15, and 17 hours of instrument flight as during the first hours. Neither the pilot's reaction time nor the performance on the written test were affected by the flights. The pilots felt capable of meeting any critical situation. (TIP abstract, modified)

McIntosh, B. B. see also Milton, J. L., 1952b

McIntyre, E. 1952
CRASH WARD. — Amer. Jour. Nursing, 52 (2): 183-184. 1952. DLC (RT1. A5, v. 52)

Location and equipment of a special disaster ward at Bolling Air Force Base in Washington, D. C., is described. The ward is an annex to the surgical division of the base hospital and only 200 yards from the landing field. Special dressing and blood transfusion equipment is provided with each bed; there is a portable "crash cart", equipped with dressings, antiseptics, gowns, rubber gloves, and other items for ready use; special emphasis is laid on equipment and drugs required in case of burn injuries, because of their frequency in plane crashes. The usefulness of the ward has been tested successfully at frequent occasions.

McKee, D. L. see Phillips, R. B., 1952

McLaughlin, S. C. 1952
A FACILITATIVE EFFECT OF RED LIGHT ON DARK ADAPTATION. — Naval School of Aviation Medicine, Pensacola, Fla. May 26, 1952. 7+[1] p. (Project report no. NM 001 059.28.01; TIP U22935). UNCLASSIFIED

The degrees of dark adaptation of 10 subjects were determined (1) after 20 min. in total darkness and (2) after 10 min. in darkness preceded by 10 min. in red light. The average threshold of the subjects was 0.151 log micro-micro-lambert lower following the red light-darkness combination than after the total darkness period. Part of the total process of visual dark adaptation is concluded to proceed more rapidly in red light than in total darkness. (TIP abstract)

MacPherson, A. E. 1952
THE MEASUREMENT OF FORCES ACTING ON A PILOT DURING CRASH LANDING. — Proc. Soc. Exper. Stress Analysis, 9 (2): 159-162. 1952. DLC (TG1.S6, v. 9)

Instrumentation is described for the purpose of measuring the deceleratory forces to which a pilot is exposed during crash landing. As the commonly used decelerometers were inadequate for this purpose, two forms of a "crash dynamometer" were developed using the deformation of metal rings as a measure of acceleratory forces.

McSurely, A. 1952
GOOD SEAT ENGINEERING SAVES LIVES. — Aviation Week, 57 (21): 87-89. Nov. 24, 1952. DLC (TA501. A8, v. 57)

The importance of seat design and construction is exemplified by the analysis of an airplane crash involving a Convair 240 (in Flushing Bay near La Guardia Airport, New York, on January 14, 1952). The plane ditched in 15 ft. of water at a speed of about 135 mph., and a normal rate of descent of about 500 ft. per min. Peak decelerations in the range of 10 to 15 g were absorbed by hull and wings. Failure of some seat anchorages indicated that standard load specifications of 6 g forward, 6.6 g downward, and 1.5 g sideways were exceeded. Still, no major injuries were incurred by the passengers due to the resilient structure of seat backs and the firm anchorage of the seats. The following improvements are recommended: (1) seats which will stand 15 g loads; (2) seat backs of ductile metal that will cushion body or head shock; (3) firm anchoring of passengers to their seats with snugly tightened 3000-lb. -load seat belts.

McWhorter, R. L. see Pryor, W. W., 1952

Madden, H. L. 1952
and G. Friedman
A FACTOR ANALYSIS OF THE STENQUIST MECHANICAL APTITUDE AND THE COOPERATIVE SCIENCE TESTS IN THE 1949 NORMATIVE SURVEY BATTERY. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. PERS 52-40, Dec. 1952. 10 p. (Project no. 503-002-0002; AD 6121). UNCLASSIFIED

The factorial compositions of the Stenquist Mechanical Aptitude Test II (SMAT II) and the Cooperative Science Test, Form S (CST-S) were determined in relation to the Airman Classification Battery AC-1A. The following tests were administered to 645 basic airmen: the 12 AC-1A tests, Reading Comprehension BI601A, Pattern Comprehension BP803C, the three parts of SMAT II, and the three parts of CST-S. These variables were intercorrelated and factor analyzed. The seven meaningful factors included mechanical experience, numerical facility, verbal comprehension, perceptual speed, visualization, reasoning, and cooperative science triplet. AC-1B tests appeared on all but the latter factor; the cooperative science factor is thought to represent exposure to academic learning. (AD abstract)

Madden, W. F. 1952
STUDIES OF AIRCRAFT ACCIDENTS INVOLVING OFFICER TRAINEES IN THE BASIC TRAINING COMMAND FOR FISCAL 1952. II. A COMPARISON OF THE ACCIDENT RATE OF STUDENT OFFICER TRAINEES WHO COMMUTE FROM PENSACOLA TO WHITING FIELD AND OFFICERS RESIDING IN THE WHITING FIELD AREA. — Naval School of Aviation Medicine, Pensacola, Fla. Special Report, June 30, 1952. 2+3 p. (TIP U69669). UNCLASSIFIED

This report is one of a series of studies attempting to identify factors contributing to aircraft accidents incurred by officer students in the Basic Training Command during Fiscal 1951. Accident data were analyzed to determine whether or not the student officers who commuted eighty miles daily to and from Pensacola to Whiting Field sustained a larger number of accidents than those officers who resided at or close to Whiting Field during their early phases of flight training. An analysis of the data indicated that there were no significant differences in the number of accidents sustained by the officer students who commuted from Pensacola each day and those who lived at Whiting Field and had no such travel problem. (Author's summary)

Maher, P. J. see Henry, J. P., 1952
Maheux, C. see Girling, F., 1952

Mahler, W. R. 1952
AN OBJECTIVE TYPE METHOD OF MEASURING FLIGHT PERFORMANCE: DEVELOPMENT AND EVALUATION IN THE NAVAL AIR BASIC TRAINING COMMAND. — Jour. Aviation Med., 23 (3): 259-263, 303. 1952.
DLC (TL555.A1A4, v. 23)

Discusses the efforts of the Psychological Corporation and the Aviation Psychology Branch of the School of Aviation Medicine, Pensacola, Florida, to improve the methods used at present in measuring flight performance. No final conclusions have been reached as yet.

Mahoney, D. I. 1952
and J. V. Kennedy
ELECTROCARDIOGRAPHIC STUDIES ON HUMAN SUBJECTS BREATHING OXYGEN AT EXTREMELY HIGH PRESSURES. — Jour. Aviation Med., 23 (6): 560-565, 588. 1952.
DLC (TL555.A1A4, v. 23)

Electrocardiograms were taken of 4 subjects breathing oxygen under pressure at ground level and at simulated altitude (65,000 feet). During the pressure breathing there was either a counter-pressure applied to the body surface to prevent peripheral venous pooling (balanced pressure breathing), or no such pressure was applied (unbalanced pressure breathing). During unbalanced breathing there was a shift of the electrical axis of the heart to the right, due to the depression of the diaphragm and a more vertical positioning of the heart. Sinus arrhythmia was accentuated at low pressures, but disappeared at higher pressures when tachycardia set in. During the period of arrhythmia there was an apparent prolongation of the Q-T interval. None of these changes is considered alarming.

Maison, G. L., 1952
E. [H.] Dustin, and J. W. Stutzman
RESPIRATORY ARREST IN RABBITS AND ANESTHETIZED DOGS EXPOSED TO HYPOXIA AFTER ADRENERGIC BLOCKADE. — In: Bauer, R. O. and others, The effects of drug-induced alterations..., p. 29-43. Wright Air Development Command. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report

no. 52-222, June 1952 (RDO no. 696-61) (ATI 171 952). UNCLASSIFIED

A high incidence of respiratory arrest in rabbits and dogs pretreated with various adrenergic blocking agents and subjected to hypoxia is demonstrated. The absence of this phenomenon in animals without drug, and in those pretreated with impotent congeners of the β-chlorethylamine derivatives is also shown. Pitressin by infusion or sub-diaphragmatic aortic occlusion raised the prehypoxic mean arterial pressure (MAP) of animals with adrenergic blockade. The total incidence of arrest was reduced in both test groups. The incidence of arrest was not reduced by pilocarpine, which further lowered MAP in animals with adrenergic blockade. In a series subjected to hypoxia with added carbon dioxide the incidence of arrest was not reduced. In a series of hypoxic trials in unanesthetized dogs given potent adrenergic blocking drugs, in which hypoxia was produced by gradual ascent in an altitude chamber to 30,000 foot pressure altitude, respiratory arrest did not occur. Thus the rate of adjustment to hypoxia appears important in determining the stress tolerance of the animal with adrenergic blockade. (Authors' summary, modified)

Maison, G. L. see also Bauer, R. O., 1952; Brown, Barbara, 1952; Dustin, E. [H.], 1952; Prochnik, G., 1952

Malmejac, J. 1952
and P. Plane
INFLUENCE OF OXYGEN WANT ON FUNCTIONAL CORTICAL FITNESS. — Jour. Aviation Med., 23 (2): 177-180, 193. 1952.
DLC (TL555.A1A4, v. 23)

A conditioned salivary reflex was induced in dogs which had an external salivary duct fistula (thus the reactions to sensory stimuli could be measured by the drops of saliva emerging from the fistula). The dogs were then subjected to anoxia either by breathing oxygen-deficient air or by altitude exposure in a decompression chamber. At exposures corresponding to an altitude of about 3,000 m. (9,800 feet), the conditioned salivary reflex was notably increased; at 5,000 to 6,000 m. (16,400 to 19,700 feet) the conditioned reflex (which is cortically controlled) decreased while the innate reflex (subcortically controlled) was normal or even exaggerated; and at still higher altitudes both the innate and the conditioned reflexes were diminished. Frequent repetition of the tests in the same animal resulted in a certain degree of acclimatization (i. e., higher altitudes had to be employed to elicit the same reactions).

Malmejac, J. 1952a
J. M. Sutter, M. Porot, H. Luccioni, and E. Bogaert
[CONTRIBUTION TO THE PSYCHOLOGICAL SUPERVISION OF FLYING PERSONNEL] Contribution à la surveillance psychologique du personnel navigant. — Médecine aéronautique (Paris), 7 (4): 419-432. 1952. In French.
DLC (TL555.M394, v. 7)

The following tests have been applied to study the physiological as well as personality structure of accident-prone pilots. Electrocardiogram and blood oxygen concentration during ascent to 8,000 - 10,000 m. [26,250 - 32,800 ft.] and descent; electroencephalogram under various conditions; psychotechnical [neuromuscular] coordination; psychological elimination by projective techniques; and, finally, psychiatric interview. After all the tests are completed, the examiners discuss their findings together. It is not possible to give a general summary of the results of these synthetic examinations as the primary cause responsible for personality failures varies with the individuals. Three phases should be distinguished in the standard psychological examination of pilots: (1) description and causes of personal problems; (2) determination of character and temperament; and (3) exploration of the status of emotivity.

Malmejac, J. 1952b
G. Chardon and G. Neverre
[DISCUSSION CONCERNING THE NORADRENALINE SECRETION OF THE ADRENAL MEDULLA DURING ANOXIA: ROLE OF DISORDERS OF PHYSICO-CHEMICAL ORIGIN] Discussion sur l'activité noradrenalinique de la medullo-surrénale au cours d'une anoxie: role des dysfonctionnements d'origine physico-chimique — Médecine aéronautique (Paris), 7 (4), 437-440. 1952. In French. DLC (TL555.M394, v. 7)

Experiments on dogs carried out by the authors demonstrate that oxygen deficiency stimulates adrenaline secretion by inducing an overactivity of the adrenal medulla. Noradrenaline appears in the blood under conditions of deficient blood supply to the adrenal gland, e. g. in the terminal phase of prolonged anoxia. It seems that anoxia has no direct effect (even if prolonged for an hour or two) on the liberation of the noradrenaline.

Malmejac, J. 1952c
and P. Plane
[OXYGEN DEFICIENCY AND DISORDERS OF THE HIGHER NERVOUS CENTERS: EXPERIMENTAL STUDY BY MEANS OF THE CONDITIONED SALIVARY REFLEX] Déficit en oxygène et dysfonctionnements nerveux supérieurs. Etude expérimentale à l'aide du réflexe salivaire conditionnel. — Médecine aéronautique (Paris), 7 (4): 448-450. 1952. In French.
DLC (TL555.M394, v. 7)

Description of a motion picture demonstrating the effects of anoxia on conditioned salivary reflexes (cf. Malmejac, J., 1952).

Malmejac, J., 1952d
S. Cruck, and G. Neverre
[ROLE OF CUTANEOUS HYPERTHERMIA IN THE PRODUCTION OF GENERAL DISTURBANCES DUE TO HIGH TEMPERATURES: MECHANISMS INVOLVED] Rôle de l'hyperthermie cutanée dans la production des accidents généraux dus aux hautes températures: mécanismes effici-

ents. — Médecine aéronautique (Paris), 7 (4): 441-447. 1952. In French.
DLC (TL555. M394, v. 7)

Experiments were made on a flap of skin of an anesthetized dog exposed to high temperatures (60-70°C.) while the animal was breathing cold air. When the temperature of the flap rose to 40-41°C., its blood supply was greatly increased, but decreased again at 42-43°C. The efferent blood of the hypothermic skin flap contained histamine and its protein balance was disturbed (increase of beta globulins). — The authors conclude that hypothermia of the skin may be responsible for various (probably hepatic) reactions which affect the general circulation and may lead to circulatory collapse.

Malmejac, J. 1952e
and A. Gross
[ADRENAL ACTIVITY IN ANOXIA: CONNECTION BETWEEN THE NERVOUS SYSTEM, THE MEDULLA, AND THE CORTEX OF THE ADRENAL GLAND] Activité surrénale en anoxie: liaison neuro-médullo-cortico-surrénale. — Médecine aéronautique (Paris), 7 (4): 451-454. 1952. In French. DLC (TL555. M394, v. 7)

Acute anoxia induces hyperactivity of both the adrenal medulla and the adrenal cortex. The mechanism involved is rather complex: secretion of adrenaline by the medulla is under the direct influence of the sympathetic nervous system; the adrenaline liberated into the blood stream then stimulates the anterior lobe of the hypophysis, which in turn secretes a hormone inducing increased cortical activity.

Malone, F. L. see Sexton, M. S., 1952
Malone, R. D. see Clark, B., 1952a, 1952c
Maloney, J. V. see Chinn, H. I., 1952f

Mancioli, G. 1952
[ON A NEW INDIVIDUAL PROPHYLACTIC DEVICE AGAINST DEAFNESS FROM NOISES] Su un nuovo mezzo di profilassi individuale contro la sordità da rumori. — Rassegna di medicina industriale (Torino), 21 (1): 11-17. 1952. In Italian. DSG

An acoustic filter, called "Selectone", is described. It is so designed as to dampen the high frequency noise ranges only, while permitting the low tones to pass (human voice range). The device consists of a mushroom-shaped perforated core made of plastic material and capped by an outer sheath made of rubber, which fits snugly into the external auditory meatus. The filter comes adapted to various ranges of elimination. Tests carried out in actual use by industrial workers gave very favorable results.

Mankiewicz, W. see Cassen B., 1952a, 1952b

Mann, C. W. 1952
AN ANALYSIS OF THE OCULOGYRAL EFFECT. — Jour. Aviation Med., 23 (3): 246-253. 1952. DLC (TL555. A1A4, v. 23)

"In a recent series of articles, Mayne has suggested that, within the limits of the linearity of the vestibular system, the duration of the subjective effects arising from the stimulation of the semicircular canals is proportional to the angular velocity. He arrives at a formula for the duration of the first effect of the form $Y = ae^{bx}$. The application of this formula to the data of nystagmus in pigeons by Mowrer and the audiogyral effect obtained by Clark and Graybiel gives a good fit to the exponential curve.

"In this study an attempt was made to apply Mayne's formula to the first effects during and after rotation in the oculogyral illusion. The curve of the data derived from the total first effects appeared sigmoidal, but a good fit to Mayne's exponential curve was obtained at velocities up to 20 r.p.m. when the formula was applied to the gross visual effects — described in this article as the 'picket fence' phase of the first effect.

"Analysis of the results indicates that the total first effect of the oculogyral illusion is made up of two components. One of these is produced by the rapid oscillations of the cupula due to its inertia during and following rotation, and the other by the finer movements of the cupula induced by the inertia of the endolymph of the semicircular canals." (Author's summary.)

Mann, C. W. 1952a
VISUAL FACTORS IN THE PERCEPTION OF VERTICALITY. — Jour. Exper. Psychol., 44 (6): 460-464. 1952. DSG

A test was conducted to check a hypothesis advanced previously by J. J. Gibson to the effect that the error in perception of the vertical will be less under consistent visual-proprioceptive stimulation (i.e., when the vertical line of the retinal field is parallel to the gravitational vertical) than under discrepant conditions. Nine test subjects were asked to align a target rod with the gravitational vertical at various stages of room and body tilt (carried out with the aid of a Navy tilting room and tilting chair). The tabulation of results supports Gibson's hypothesis. When visual stimulation is increased to a point at which the subject can identify himself with the visual framework, a conflict arises between the visual stimulation produced by the framework and the proprioceptive stimulation produced by the gravitational force. In judging the vertical, reliance will be placed upon the proprioceptive stimulus variables, until the visual factors become sufficiently effective to conflict with the proprioceptive variables. At this point a compromise judgment will be made somewhere between the inclination of the visual field and the gravitational vertical.

Mann, C. W. 1952b
VISUAL FACTORS IN THE PERCEPTION OF VERTICALITY. — Aug. 19, 1952. 5+2 p. Tulane Univ., New Orleans, La. (Contract N7onr-434, Task order 1); and Naval School of Aviation Medicine, Pensacola, Fla. (Project report no. NM 001 063. 01. 29, Joint project report no. 29) (TIP U25747). UNCLASSIFIED

Same as the paper, Mann, C. W., 1952a.

Mann, C. W. 1952c
and R. O. Boring
THE ROLE OF INSTRUCTION IN EXPERIMENTAL SPACE PERCEPTION. — Sept. 1, 1952 6 p. Tulane Univ., New Orleans, La. (Contract N7onr-434, Task order 1); issued by Naval School of Aviation Medicine, Pensacola, Fla. (Project report no. NM 001 063.01.30; Joint project report no. 30) (TIP U12592). UNCLASSIFIED

Two groups of four subjects each were required to set a luminescent rod to a "vertical" during exposure to visual frameworks which were sometimes tilted and sometimes upright. One group was given careful instructions as to what was meant by "vertical". The other group was simply instructed to set the luminescent rod to vertical. The constant and average errors made by the naive group were consistently larger than those made by the sophisticated group. It is inferred that a number of criteria of verticality are possible in the relatively simple experimental situation employed and that different criteria may be selected by different subjects. (Authors' summary)

Mann, C. W. 1952d
SUBJECTIVE EFFECTS OF DIFFERENT ROTATIONAL VELOCITIES. — Tulane Univ., New Orleans, La. (Contract N7onr-434, Task order 1); and Naval School of Aviation Medicine, Pensacola, Fla. (Project report no. NM 001 063.01.24). Joint project report no. 24. March 30, 1952. 5+4 p. (DSG) UNCLASSIFIED

Mayne's formula for the duration of the first subjective effect following stimulation of the semicircular canals is of the form $Y = ae^{bx}$. An attempt was made to apply Mayne's formula to the first effects of the oculogyral illusion during and after rotation. A good fit was obtained to Mayne's exponential curve up to velocities of 20 r.p.m. for the gross visual effects. The analysis indicated that the total first effect of the oculogyral illusion is made up of two components: rapid oscillations of the cupula, and finer movements of the cupula induced by the inertia of the endoylmph of the semicircular canals. (Naval School Aviation Medicine abstract)

Marbarger, J. P., 1952
S. A. Franzblau, G. F. Vawter, and R. W. Keeton
ALTITUDE STRESS IN SUBJECTS WITH IMPAIRED CARDIORESPIRATORY FUNCTION. I. CONTROL STUDIES ON NORMAL SUBJECTS. — School of Aviation Medicine, Randolph Field, Tex. April 1952. iii+21 p. (Project no. 21-23-019, Report no. 1; TIP U22214). PB 106798

Observations were made of the physiological response of 10 young healthy men who were taken to simulated altitudes of 10,000 and 18,000 ft. in a low-pressure chamber while lying supine on a ballistocardiograph. The total effective peripheral vascular resistance was markedly decreased at simulated altitudes up to 18,000 ft. The response of the left ventricle was not significantly altered by a 10-min. exposure at 10,000 ft. but increased by about 50% after an exposure of 5 min. at 18,000 ft.; administration of oxygen at the higher altitude caused an almost immediate return of both to ground-level values. Sudden exposure to ambient air at 18,000 ft. increased both pulse rate and stroke volume, the former reaching a maximum in 10 min. but the latter continuing to increase with increasing exposure time. Increased stroke volume was responsible for the increase of cardiac output at high altitudes. (TIP abstract)

Marbarger, J. P. see also Brown, Arnold L., 1952, 1952a

Marcks, C. A. 1952
HOW DOES EQUIPMENT AND CLOTHING AFFECT THE PROBLEMS OF EMERGENCY SYSTEMS DESIGN. — Bureau of Aeronautics (Navy), Washington, D. C. [1952]. 7 p. [Paper presented at Conference on Problems of Emergency Escape in High Speed Flight, Sep. 29-30, 1952, at Wright-Patterson Air Force, Base, Ohio]. (AD 14 344). UNCLASSIFIED

Problems are discussed resulting from personal equipment and protective clothing of pilots, such as lap and shoulder crash harness, summer and winter flight clothing, anti-g suits, anti-exposure suits, heated suits, pressure suits, protective helmets, visors, oxygen equipment, emergency bail-out oxygen, parachutes of various sizes and designs, and various kits to permit emergency survival on both land and sea. The bulk and weight of this gear has an adverse effect on pilot efficiency, impedes movements during normal flight operations, and jeopardizes safe escape under emergency conditions; it also adversely affects the over-all design of the airplane. The escape capsule, which incorporates most of the protecting features of personal protective clothing and equipment, seems to be a step in the right direction toward solving the problems discussed in this paper.

Marks, G. 1952
and W. W. Pryor
ACCUMULATIVE EFFECT OF RAPID AND EXPLOSIVE DECOMPRESSION UPON PULMONARY FUNCTION. — Amer. Jour. Physiol., 171 (3): 748. 1952. DLC (QP1.A5, v. 171)

Eight subjects were exposed, during a period of 1 to 6 years, to repeated explosive decompression; on one occasion, the intrapulmonary pressure was as high as 145 mm. Hg above the pressure of the environment. The same subjects were able to breathe against partially balanced positive pressures as high as 150 mm. Hg. No significant cumulative changes were found, even after such exposures for several years, as compared to normal values in total lung volume, vital capacity, and maximum breathing capacity.

Marley, F. W. 1952
INDIVIDUAL DIFFERENCES IN CRITICAL AIRCREW ELEMENTS. I. THE DETERMINATION OF CRITICAL PROFICIENCY REQUIREMENTS FOR B-29 COMBAT CREWS. — April 1952. 17 p. American Inst. for Research, Pittsburgh,

Pa. (Contract AF 33(038)10476); and School of Aviation Medicine, Randolph Field, Tex. (Project no. 21-29-014, Report no. 1) (TIP U23926).
UNCLASSIFIED

Basic aircrew performance data were collected, analyzed, and structured to provide a foundation for the subsequent development of reliable and valid proficiency measures for B-29 combat crews. Data on aircrew performance were obtained by analysis of existing evaluation forms, study of technical aircrew literature, individual and group interviews with flying personnel, analysis of bombardment wing gross error board reports, and reference to previously obtained critical incidents. The data were integrated and utilized to develop tentative lists of proficiency evaluation items for each of seven B-29 aircrew positions: airplane commander-pilot, navigator, bombardier, radar operator, flight engineer, radio operator, and gunner-scanner-air refueler. Arrangements were made to obtain, through judgment by qualified experts, information regarding the relative importance of the various items. The procedures discussed appear to provide a sound basis for the development of adequate proficiency-evaluation techniques. (TID abstract)

Marshall, L. H., 1952
C. H. Hanna, and H. Specht.
RENAL FUNCTION IN THE DOG DURING INCREASED BLOOD VISCOSITY PRODUCED BY SIMULATED ALTITUDE EXPOSURE. — Amer. Jour. Physiol., 171 (2): 499-506. 1952.
DLC (QP1.A5, v. 171)

The effect of intermittent exposure (up to 10 weeks) of dogs to gradually lowered barometric pressure on the blood and on renal function was investigated. Tests were made at ground level and at simulated altitudes of 10,000, 15,000, and 20,000 feet. No change was observed in circulation time, plasma specific gravity, and mean arterial blood pressure. Whole-blood specific gravity was proportional to the increase in hematocrit value (138-143% of ground level values at 20,000 feet). Relative viscosity increased to an average of 187% of the initial ground level value. There were moderate increases in effective renal plasma flow at 20,000 feet, indicating an increased whole-blood flow (256% of initial ground level value) through the kidneys, since the plasma fraction of the blood had decreased (high hematocrit value). Glomerular filtration increased at altitude at a faster rate than did the effective renal plasma flow, while the tubular transfer value decreased. The physiological implications of the findings are discussed.

Martin, M. T. 1952
MEDICAL ASPECTS OF HELICOPTER AIR EVACUATION. — Jour. Aviation Med., 23 (1): 20-23; discussion, p. 23, 76. 1952.
DLC (TL555.A1A4, v. 23)

The use of helicopters for air evacuation and rescue was first introduced on a large scale in the Korean campaign in 1950. The advantages of helicopter transportation of military casualties and of surrounded military personnel (pilots who have crash-landed or bailed out, etc.) is discussed. Helicopters may also be used in civilian rescue missions in forest fires, and other emergencies.

Martin, W. B. 1952
and E. E. Johnson
AN OPTIMUM RANGE OF SEAT POSITIONS AS DETERMINED BY EXERTION OF PRESSURE UPON A FOOT PEDAL. — Army Medical Research Lab., Fort Knox, Ky. Report no. 86, June 15, 1952. ii+9 p. (AMRL Project no. 6-95-20-001, Subtask S-1; AD 21 654).
UNCLASSIFIED

Tests on 166 men with anthropometric measurements representative of Army male personnel in general revealed that: (1) For the positions in which the most pressure was exerted (25 per cent of total positions tested) the mean vertical adjustment of the pedal was 2.4 inches above the seat and the mean horizontal adjustment from seat to pedal was 33.2 inches; (2) the mean vertical adjustment for the position at which most foot pressure could be applied was 3.5% of the average body height (standard deviations 2.7%) and the mean horizontal adjustment was 47.5% of the average body height (SD = 2.3%); (3) in generalizing for the average height of Army male personnel (68.4 inches), the position at which the greatest pressure could be exerted upon a foot pedal would require a vertical distance from seat to pedal of 2.4 inches ± 0.3 inch, and a horizontal distance of 32.5 inches ± 4.25 inches. It is concluded that: in the optimum positions for exertion of pressure upon a foot pedal the pedal is slightly above the level of the seat; changes in horizontal seat-to-pedal distance affect the foot pressure more than like changes in vertical seat-to-pedal distance; an optimum range of seat-to-pedal distance can be related to body height. (Authors' results and conclusions)

Mases 1952
and Falet
[FATIGUE IN JET PLANE PILOTS] La fatigue chez les pilotes d'avions à réaction. Médecine aéronautique (Paris), 7 (4): 347-353. 1952.
In French. DLC (TL555.M394, v. 7)

The answers of jet-plane pilots to a questionnaire concerning the factors causing fatigue are analyzed in detail. This fatigue differs from that of regular aviators; it has a slow "incubation", maturing after a period of time. This phenomenon seems to be related to either insufficiency or excess of adaptation. Altitude and speed seem to have a considerable role in "jet plane fatigue". Psychological implications of jet flight, temperature, and anxiety because of the behavior of instruments under unusual conditions must likewise be considered.

With regard to the factors most liable to cause fatigue, the pilots indicated speed (60%), nervous tension (30%), and continual flight-path correction (10%); none mentioned altitude, although 50% of them stated that flight was more tiresome above 20,000-25,000 feet. The activities

declared to be most tiring were piloting at high altitude (68%), piloting at low altitude (23%), and navigation at high altitude (6 cases). The factors contributing to nervous tension are given as: formation flight, flight in the clouds, anxiety over the functioning of the plane, and uncertainty as to meteorological conditions, heat prevailing in the cockpit, visual blurring, and inconvenient posture. Two flights daily and 25-30 flight hours per month are considered to be tolerated without any harmful aftereffects.

Matthews, J. G. see Van Liere, E. J., 1952

Mauclet, R. 1952
[STUDY ON THE TOXICITY OF FUEL USED IN THE MOTOR OF JET PLANES: CUTANEOUS SENSITIVITY OF CERTAIN SUBJECTS TO KEROSENE] Étude sur la toxicité des carburants employés pour les moteurs des avions à réaction: sensibilité cutanée de certains sujets au kérosène. — Annales belges de médecine militaire (Liège), 105 (9-10): 162-164. 1952. In French.
DSG (W1 AN3092, v. 105)

Mechanics handling jet fuel are subject to two kinds of poisoning: skin poisoning by absorbed fuel and poisoning by inhalation of fuel vapors. Symptoms of acute kerosene poisoning are headache, defective vision, mental confusion, fatigue and often nausea, abdominal pain, and loss of consciousness. In certain cases, convulsive seizures occur just as in epilepsy. Chronic poisoning is harder to diagnose; the most frequent symptoms are loss of weight, increased pulse rate, severe secondary anemia, diarrhea, mental confusion, and skin irritation. — Rubberized clothing, and rubber boots and gloves give the best protection against kerosene poisoning.

Maurath, J. 1952
and P. Hauer
[ACID-BASE EQUILIBRIUM AND RESPIRATORY REGULATION IN CHRONIC HYPOXEMIA] Säure-Basengleichgewicht und Atemregulation bei chronischer Hypoxämie. — Klinische Wochenschrift (Berlin), 30 (13-14): 315-319. Apr. 1, 1952. In German. DSG

The following observations were made on patients with chronical hypoxemia caused by pulmonary insufficiency: (1) inhalation of oxygen caused complete vascular oxygen saturation, an increase of arterial plasma carbon dioxide, and a corresponding decrease in pH; (2) a decrease in pulmonary ventilation; and (3) an increased ability of the arterial blood to combine with CO_2 (this abnormality ceases upon termination of the anoxic stage). The kidney was observed to act in a compensatory capacity (increase of alkali reserve) upon extensive inhalation of O_2. The physiological mechanism of the observed phenomena is discussed.

[Mayo, A. M.] 1952
[EFFECT OF ACCELERATIONS ON THE HUMAN BODY] Wirkung von Beschleunigungen auf den menschlichen Körper. — Weltraumfahrt (Frankfurt), 1952 (2): 48-49. 1952. In German.
DLC (TL789.W45, 1952)

G-tolerance values of the human body in various positions, and their relation to different flight maneuvers and time spans, are graphically and diagrammatically represented. The article is based on a lecture by A. M. Mayo of the Douglas Aircraft Co., entitled: "Basic Environmental Problems Relating to Man in the Aeropause as Seen by an Aeronautics Engineer."

Mayo, A. M. 1952a
BASIC ENVIRONMENTAL PROBLEMS RELATING MAN AND THE AEROPAUSE AS VISUALIZED BY THE AERONAUTICAL ENGINEER. — In: Physics and medicine of the upper atmosphere: a study of the aeropause, p. 6-22. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico Press, 1952. DLC (RC1050.U5, 1952)

Flight in the aeropause will impose great physiological and psychological demands on pilot and crew. The rapid advances in aircraft construction call for a corresponding step-up in education and training. The human factor should, on the other hand, be considered in the design of equipment and instrumentation. The latter should be reduced to the absolute essentials. Further clarification of the visual effects of reduced light dispersion is required. The reduction of the time-distance factor in high-speed flight will put more reliance on automatic control mechanisms, confining the human element to slow-rate monitoring operations. Temperature regulation systems will have to be adapted to the increasing speeds (a chart indicating various cooling systems practicable at the various speed ranges is presented). Problems concerning pressurization, physiological effects of acceleration, of noise, and vibration are discussed. Brief sections are dedicated to radiation and meteor hazards. General principles of escape mechanisms are analyzed. In conclusion it is recognized that a compromising formula is to be worked out to balance all factors involved and keep the resulting costs at a minimum.

Mayo, A. M. 1952b
ESCAPE DEVICES REQUIRED FOR FUTURE AIRCRAFT. — Douglas Aircraft Co., Inc., El Segundo, Calif. [1952]. 14 p. [Paper presented at Conference on "Problems of Emergency Escape in High Speed Flight", Sept. 29-30, 1952, at Wright-Patterson Air Force Base, Ohio]
(AD 14 353). UNCLASSIFIED

In objectively analyzing the application of aircraft escape and safety devices, morale, strategic, and economical considerations have to be taken into account. Problems regarding composition, pressure, and temperature of the air within the escape device become more difficult in high-altitude and high-speed flight. A pictorial description of the escape systems presently in use is presented (over-the-side bailout, personnel chute escape, ejection seat escape, jettisonable nose escape, ejection seat capsule, and ejectible

cockpit capsule escape). Probable safe bailout speeds are plotted against altitude, to serve as an aid in designing escape chute installations.

Mazza, V. 1952
PROBLEM OF DESCENT (ESCAPE FROM AIRCRAFT BY EJECTION AND FREE FALL). — [Wright Air Development Center, Wright-Patterson Air Force Base, Ohio]. [1952]. 3 p. [Paper presented at Conference on "Problems of Emergency Escape in High Speed Flight", Sept. 29-30, 1952, at Wright-Patterson Air Force Base, Ohio] (AD 14 356). UNCLASSIFIED

A personal account of experiences gained during ejection-seat bailouts, as well as a discussion of a film on this subject are presented by way of introduction. Tests comparing ejection-seat and free-fall bailouts from 35,000 ft. and 40,000 ft. altitude led to the recommendation of "free-fall" bailouts (the pilot being separated from the seat two seconds after ejection and a parachute release mechanism being put in operation automatically). Escape at altitudes above 50,000 ft. involves four major problems: Low barometric pressure, low temperatures, tumbling, and automatic parachute deployment.

Mendes, M. F. 1952
[AVIATION MEDICINE IN THE UNITED STATES] A medicina de aviacão nos Estados Unidos. — Revista médica da aeronáutica (Rio de Janeiro), 4 (2): 5-18. In Portuguese. 1952. DSG (W1 RE609, v. 4)

An account of the author's participation at the conference of the International Aeromedical Association in the United States in 1952. At this occasion the author gives a detailed analysis of the training of flight surgeons in the U. S., and of his visits to the School of Aviation Medicine at Ranfolph Field, Texas, Wright Patterson Airfield, and other aviation centers in the country.

Mendes, M. F. 1952a
[FACTORS WHICH AFFECT AVIATORS DURING THE PERFORMANCE OF THEIR DUTIES] Fatôres que afetam aos aviadores, durante o desemphenho de seus deveres. — Revista médica da aeronáutica (Rio de Janeiro), 4 (3): 5-18. 1952. In Portuguese. DSG (W1 RE609, v. 4)

The last decade witnessed the expansion of the literature of aviation medicine. The majority of pertinent studies centered around three physical phenomena: the density of air, the ambient temperature, and acceleration. — The factors most likely to affect the pilot during flight, such as altitude, temperature, noise, light, position of the body in flight, diet, and fatigue are analyzed in some detail.

Mendes, M. F. 1952b
[ACCOMPLISHMENTS OF THE AERONAUTICAL HEALTH SERVICE] Realizações do Servico de Saúde da Aeronáutica. — Revista médica da aeronáutica (Rio de Janeiro), 4 (4): 5-12. 1952. In Portuguese. DSG (W1 RE609, v. 4)

The organization and the services of aviation medicine in Brazil are closely connected with the physical and psychological aspects of recruitment and selection of pilot candidates, with the establishment of proper training facilities for physicians, pharmacists, and nurses, and with the improvement of public health in the entire country.

Mendes, M. F., 1952c
W. Basgal, and W. Lins
[A NEW OCCUPATIONAL DISEASE IN AVIATION] Uma nova doenca profissional em aviação. — Revista médica da aeronáutica (Rio de Janeiro), 4 (4): 13-22. 1952. In Portuguese. DSG (W1 RE609, v. 4)

In two groups of fighter pilots examined, 35% of one group of 37 and 33% of another group of 42 had hemorrhoids. It is of interest that none of the subjects examined were aware of any objective or subjective symptoms before flying a fighter plane. Acceleration and sudden changes of barometric pressure are the primary etiological factors responsible for this condition. With regard to acceleration, the direction, intensity and duration of the centrifugal forces are the most important elements. Venous pressure increases gradually during positive acceleration; this venous hypertension is more emphasized in the abdominal venous plexus, consequently in the ano-rectal region. Changes in atmospheric pressure (very frequent in the flight of a fighter plane) affect peripheral circulation. — Any record of previous ano-rectal abnormality should be noted in pilot selection. As preventive measure against hemorrhoids, a sensible diet, avoidance of emotional disturbance, and wearing an anti-g suit are recommended.

Mendes, M. F. 1952d
[BRAZIL AND AVIATION MEDICINE IN NORTH AMERICA] O Brasil e a medicina de aeronáutica da America do Norte. — Imprensa médica (Rio de Janeiro), 24 (462): 25-32. 1952. In Portuguese. DSG

A report is presented on the convention of the International Aeronautical Association (held in Washington, March 17-21, 1952), which the author attended as a delegate of the Academia Brasileira de Medicina Militar. Visits to Gunther Airbase (Alabama), Eglin Field (Florida), Randolph Field (Texas), and Wright Patterson Airbase (Ohio) are described, and curricula and training procedures analyzed and discussed.

Meneely, G. R. <u>see</u> Lemley, J. M., 1952

Mercier, A. 1952
J. Moracchini, and J. Duguet
[EFFECT OF ANOXIA ON VERTICAL HETEROPHORIAS] Action de l'anoxie sur les hétérophories verticales. — Médecine aéronautique (Paris), 7 (4): 519-521. 1952. In French. DLC (TL555.M394, v. 7)

The effects of anoxia (altitude) on vertical heterophorias in accomodation for far and near

distances were studied in a limited number of subjects. In far vision (6 m.), heterophorias were little affected by altitude, were sometimes improved and sometimes worsened. In near vision (40 cm.), however, heterophorias were considerably aggravated by altitude (4,000 m.), the difference sometimes amounting to 2 prism diopters. The significance of this phenomenon for pilots is pointed out; with the increased reliance on flying instruments, precise visual perception at short distances has become of utmost importance. The possible mechanisms involved in the variations of heterophoria are discussed.

Mercier, A. see also Duguet, J., 1952

Meyer, A. F. 1952
NOISE, AN OCCUPATIONAL HAZARD IN THE USAF. — Occupational Health Monthly, 12 (5): 75. 1952. DSG

Noise levels of 70 to 140 decibels are produced in aviation as results of takeoff and landing operations, as well as of engine testing on the ground. Temporary hearing losses up to 25 decibels are quite common in this range. Acute exposure to 160 decibels may cause rupture of the eardrum. Studies undertaken on 3 groups of operators revealed maximum chronic hearing losses of 25 decibels in a group exposed for 3.8 years, of 40 decibels in those exposed for 7.4 years, and of 50 decibels in a group exposed for 11.1 years to a frequency of 4,820 cycles per second. Removal from the noisy environment produced recovery of from 5 to 10 decibels in 30 days.

Psychosomatic effects of speech interference in aviation communication systems have become the object of recent studies in the U. S. Air Force. Acceptable standards of interference are being set up. Investigations of accidents have revealed possible correlations of accidents with fatigue due to excessive noise. Improvements of sound suppression equipment and of the acoustical design of airplane structures are now under consideration.

Meyer, A. F. see also Boysen, J. E., 1952

Middleton, R. H. 1952
and E. Comfort
A-20 EXPERIMENTAL CONTINUOUS-FLOW OXYGEN MASK. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. Memorandum report no. WCRDF-696-107M, Jan. 18, 1952. 3 p. (AD 63 108). UNCLASSIFIED

An improved experimental model of the A-20 continuous-flow oxygen mask produced by Aero Medical Products, Inc., is described. Two design changes have been incorporated in this model: (a) the distance between the mask strap studs has been increased for greater stability; and (b) a cover has been molded over the top half of the expiratory valve to deflect expired air away from the eye region of the wearer. Tests led to the conclusion that the mask is capable of maintaining an equivalent air-breathing altitude of 5000 to 10,000 feet when used with the A-9-A oxygen regulator or comparable oxygen flow under conditions of inactivity and mild activity at altitudes up to 30,000 feet, and is, therefore, physiologically adequate for the intended purpose.

Middleton, R. H. 1952a
SKIN PRESSURE MEASUREMENTS, ALTITUDE SUIT. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. Technical Note no. WCRD 52-61, Sept. 1952. 6 p. (ATI 173 046). UNCLASSIFIED

The partial-pressure altitude suit has been suggested as a means of protecting individuals exposed to explosive decompression at high altitudes. It incorporates the use of a socalled "capstan ready pressure", which is equal to approximately 50 mm. Hg capstan pressure. This ready pressure is intended to furnish the wearer a means of stabilizing counterpressure during sudden decompression. Certain portions of the body, such as the hands and feet, are not pressurized (hence the name "partial-pressure suit"). This design limitation allows unbalanced pressure areas, and leads to pooling of blood and edema in the hands and feet. The capstan system provides optimal counterpressure over the extremities required during periods of high-pressure breathing. However, inadequate pressurization of certain areas of the trunk (back, groin, and axilla) create a necessity for limiting the use of the partial-pressure suit to emergencies of relatively short duration.

Middleton, R. H. see also Comfort, E., 1952; Hull, W. E., 1952

Milch, L. J., 1952
R. F. Redmond, H. I. Chinn, and others.
SERUM LIPOPROTEINS DURING AGING OF AIR FORCE FLYING PERSONNEL. — Jour. Aviation Med., 23 (6): 589-593. 1952. DLC (TL555.A1A4, v. 23)

Serum lipid and lipoprotein contents were determined in 300 pilots divided into 3 age groups: 20-25, 30-35, and 40-45 years; one age group, 40-45 years, of non-flying officers served as controls. Results of the tests indicated that the mean serum concentration of lipoproteins of the group S_f 12-20 [i.e., with a flotation rate between 12 and 20 Svedberg units, see Science, 111 (2877): 166-171. Feb. 17, 1950] is a linear function of chronological age. Individual variations in physiological age account for deviations from these mean values. Other serum components such as total cholesterol, cholesterol/phospholipid ratio, and albumin/beta globulin ratio did not reveal any of these characteristics. Repeated exposures to altitude, flying time, and stress due to flying did not have any effect on blood serum lipids. None of the serum components examined showed significant differences between the flying and the non-flying 40-45-year groups.

Milch, L. J., 1952a
R. F. Redmond, and H. I. Chinn
THE EVALUATION OF CLINICAL TESTS FOR ATHEROSCLEROSIS. III. SERUM LIPOPROTEINS DURING AGING OF AIR FORCE FLYING PERSONNEL. — School of Aviation Medicine, Randolph Field, Tex. May 1952. iii+4 p. (Project no. 21-32-027, Report no. 3; TIP U24132). PB 107465

Same as the paper, Milch, L. J., 1952

Milch, L. J. see also Chinn, H. I., 1952, 1952c; Redmond, R. F., 1952
Miller, M. M. see Lippert, S., 1952

Milton, J. L. 1952
ANALYSIS OF PILOTS' EYE MOVEMENTS IN FLIGHT. — Jour. Aviation Med., 23 (1): 67-76. 1952. DLC (TL555.A1A4, v. 23)

The eye movements of pilots and the eye fixations on instruments were recorded photographically during instrument landings (by the Instrument Low Approach System and the Ground Control Approach system) and during flight maneuvers (climbing, descending, turns). Length of fixation cycle, number of fixations per minute, and duration of fixations were determined for each instrument. Frequency of eye movements between each two instruments ("link value") was analyzed. Differences were observed between the performance of individual pilots (e.g., number of fixations per minute, 29-154; duration of fixation, 1.4-0.4 second). — The technique of eye-movement recording promises to be an effective method for the evaluation of instrument interpretation and of instrument-panel arrangement.

Milton, J. L. 1952a
and F. J. Wolfe
FIXATIONS DURING ZERO-READER APPROACHES IN A JET AIRCRAFT. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-17, Feb. 1952. iv+15 p. (TIP U22194). PB 106957

Frequency, duration, and sequence of eye-fixation were recorded for 10 pilots flying Zero-Reader approaches under simulated instrument condition. Each pilot made one practice Zero-Reader approach and then a second approach during which his eye movements were photographed. Comparisons were made between fixation patterns produced during the Zero-Reader and the standard cross-pointer instrument (ILAS) approaches. The Zero-Reader, which includes directional-gyro and cross-pointer information, received the same amount of attention during Zero-Reader approaches as the directional gyro and cross-pointer did during ILAS approaches. The gyro-horizon and the air-speed instruments were the next most frequently used instruments in both types of approaches. The optimal instrument panel arrangement for Zero-Reader approaches (with frequency and length of eye movements as the criteria) apparently requires the location of the Zero-Reader in the top center position, with the gyro-horizon and air-speed indicators located adjacent and horizontal. (TIP abstract)

Milton, J. L., 1952b
B. B. McIntosh, and E. L. Cole
FIXATIONS DURING DAY AND NIGHT GCA APPROACHES USING AN EXPERIMENTAL INSTRUMENT PANEL ARRANGEMENT. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. AF Technical report no. 6709, Feb. 1952. v+35 p. (RDO no. 694-31; ATI 158 203). UNCLASSIFIED

The frequency, duration, and sequence of eye fixations made by 15 pilots when flying day and night GCA approaches with a new panel arrangement are summarized. For purposes of comparison, data previously obtained with the standard Air Force panel arrangement during GCA approaches under day conditions are included. All conditions investigated showed that the air speed, directional gyro, gyro horizon, and vertical speed are the most used instruments. Significantly more fixations were made during day GCA than during night GCA. The average length of all fixations was shorter during the day although not significantly so. The average length of fixation on some of the individual instruments, however, was significantly shorter during day GCA. The total number of fixations and the average length of all fixations were approximately the same for both the standard and the new panels. There were significant differences between numbers of fixations on some of the individual instruments. The length of fixations did not vary significantly for any of the instruments. Considering the results of this study and the results of other studies which show that the optimal spacing between instruments is short and horizontal, and that instruments in the top row tend to be fixated first and more frequently, the standard panel appears to represent a better panel arrangement for GCA approaches. (Authors' abstract)

Milton, J. L. see also McIntosh, B. B., 1952
Missenard, A. see Placidi, T., 1952
Mitchell, R. B. see Berry, L. J., 1952, 1952a, 1952b

Mitra, S. K. 1952
THE UPPER ATMOSPHERE. — xxiv+713 p. Calcutta: Asiatic Society, 1952. (Asiatic Society Monograph Series, vol. 5). DLC (QC879.M49, 1952)

This is a comprehensive study of the physical, chemical, and meteorological aspects of the upper atmosphere. The latest advances in rocket flight are reviewed. The following principal topics are included: Atmospheric oscillations and "tides" in the upper atmosphere; temperature and density distribution in the middle atmosphere; meteoric phenomena; the ozonosphere; oxygen and nitrogen in the upper atmosphere; the ionosphere; electric currents in the upper atmosphere; aurora polaris; lights from the night sky; temperature in the upper atmosphere; and rocket exploration of the upper atmosphere. A bibliography of about 960 references is included.

Moles, A. 1952
[PHYSICS AND TECHNOLOGY OF NOISE]
Physique et technique du bruit. — xii + 156 p. Paris: Dunod, 1952. DLC (QC243.M65)

In the chapter, Noise, a Physiological Phenomenon (p. 62-83), the physiological effects of noise are reviewed. A large part of the book is devoted to the reduction of noise. A bibliography of 27 references is appended.

Mollet, R. see Evrard, E., 1952c

Monteiro, A. R. de Castro 1952
[HISTORY OF AVIATION MEDICINE IN BRAZIL]
História da medicina aeronáutica no Brasil. — Revista médica da aeronautica (Rio de Janeiro), 4 (3): 17-32. 1952. In Portuguese. DSG (W1 RE609, v. 4)

The establishment and development of aviation medicine in Brazil are discussed; the first publications in this specialty appeared in 1923 in Brazil and the interest in it has grown steadily ever since.

Monteiro, A. R. de Castro 1952a
[HISTORY OF AVIATION MEDICINE IN BRAZIL]
História da medicina aeronáutica no Brasil. — Imprensa médica (Rio de Janeiro), 28 (457): 95-108. 1952. In Portuguese. DSG

The medical service of the Brazilian Air Force is an offspring of the military and civilian health services. The beginnings of the psychological laboratory, of the first health council composed of aviation medicine specialists, the various special courses offered by the Army and Navy, and developments following the establishment of the ministry of aeronautics are described.

Moore, E. W. see Payne, B. A., 1952

Moore, J. V. 1952
and Robert G. Smith
ASPECTS OF NONCOMMISSIONED OFFICER LEADERSHIP. — Air Training Command. Human Resources Research Center. Technical Training Research Lab., Chanute Air Force Base, Ill. Technical report no. 52-3, Oct. 1952. v+9 p. (Project no. 507-009-0001; TIP U25470). PB 108226

The results of interviews of 301 officers, airmen, and noncommissioned officers (NCO's) and the answers to questionnaires given to nearly 500 airmen and NCO's were analyzed to determine problems of NCO leadership. — The characteristics of good and poor NCO's mentioned by airmen, officers, and NCO's differed considerably. The implications of this finding for research on leadership are pointed out. — Five major problems of NCO leadership emerged from the interview and questionnaire results. These were as follows: (1) need for NCO leader training; (2) need for a distinction in rank between supervisors and technicans; (3) need for more authority for and backing of NCO's; (4) conflict between leadership ideologies; (5) need for re-examination of the method of selecting NCO's. The implications of these problems for research and action are discussed. (Authors' abstract)

Moracchini, J. see Mercier, A., 1952

Morais, C. 1952
[SURGICAL PROBLEMS IN AERONAUTICS]
Problemas cirúrgicos da aeronautica. — Revista médica da aeronautica (Rio de Janeiro). 4 (3): 61-68. 1952. In Portuguese. DSG (W1 RE609, v. 4)

In airplane accidents, the regions of the body most frequently injured are as follows, in decending order: (1) in 80-90% of the cases, the head (facial maxillary area, and the base of the skull); (2) the abdomen; (3) the upper extremities (arm, clavicle, elbow, and lower arm); (4) the thorax (resulting in mediastinal hemorrhage, pleuropulmonary and cardiac lesions); (5) renal lesions (laceration of the parenchyma or of the arteries); (6) lesions of the vertebral column (compression fracture); (7) fracture of the pelvis (including fractures of the acetabulum and of the head of the femur); (8) lacerations of the perineum and scrotum due to the pressure of vertical forces; (9) lesions of the lower extremities (as frequent but not so grave as those of the cranio-facial region); and (10) burns. Problems involved in the transportation of the injured are discussed.

Morant, G. M., 1952
D. G. V. Whittingham, and G. D. Samuel
A SURVEY OF MEASUREMENTS OF FEET AND FOOTWEAR OF ROYAL AIR FORCE PERSONNEL. — RAF Inst. of Aviation Medicine (Gt. Brit.), Farnborough. Report no. FPRC 761, July 1952. 36+1 p., 5 plates. (TIP U25574). UNCLASSIFIED

This report is concerned with a survey providing foot measurements of 200 men in the R. A. F. (100 flying personnel and 100 ground staff) and measurements of the boots and shoes they were wearing. Comparisons are made between this series and one of 5566 United States soldiers, with the object of discovering how far data of the latter can be used in dealing with the sizing of new types of footwear for British Service communities. Following particulars of both surveys, topics treated are: (a) the clinical examination of the feet of the R. A. F. personnel; (b) the accuracy of the measurements of feet and footwear; (c) a reduction and comparison of the foot measurements of the two surveys; (d) the measurements of footwear (R. A. F. survey) and their relations to foot measurement; (e) the grading of measurements for different sizes and fittings of footwear; (f) the use of data for foot measurements in developing new footwear, with reference to the development of a flying boot. (Authors' summary)

Morant, G. M. 1952a
SURVEYS OF THE HEIGHTS AND WEIGHTS OF ROYAL AIR FORCE PERSONNEL. VII. HEIGHTS AND WEIGHTS OF 137 ROYAL AIR

FORCE APPRENTICES RECORDED ON FIFTEEN OCCASIONS. — Flying Personnel Research Committee (Gt. Brit.). Report FPRC 711(f), March 1952. 17+5 p. (AD 9758).
UNCLASSIFIED

The relation between (a) growth as assessed by height and weight and (b) health, physical fitness, and academic standing was investigated by analysis of height, weight, medical history, physical standard, and examination results of 137 RAF Apprentices (age, 15-22 years). The subjects were measured 15 times during a period of almost 3 years, and physical standards were assessed by physical training instructors. Analyses indicated no significant association among health, physical fitness, ability, and age, and no evidence was found of seasonal fluctuations in the growth rates for either height or weight. The growth rate for height was appreciably accelerated in the last 2 years of observation, and the growth rate for weight was slightly accelerated during the same period. All the subjects probably reached their maximum heights at an age of 17 to 22 years, and the completion of skeletal growth appeared to vary individually. No significant association existed between (a) weight levels or changes in weight during particular intervals and (b) health, physique, or examination results. Stress and changes in living conditions appeared to have the greatest influence on weight fluctuations.

Morant, G. M. 1952b
RESULTS OF TESTS IN A DECOMPRESSION CHAMBER OF 610 FLYING PERSONNEL. — Flying Personnel Research Committee (Gt. Brit.). Report no. 793, June 1952. 10 p. (TIP U69637).
UNCLASSIFIED

A summary is given of records for 610 flying personnel who had a standard PRU test in a decompression chamber. Each subject had three runs unless he was failed before completing them on account of severe reactions. Tables give: (1) a classification of the men with regard to the distinction between mild symptoms and symptoms necessitating descent, but without reference to different kinds of symptoms; (2) a classification of sites of severe pain in limbs; (3) a classification of severe symptoms other than severe pain in limbs, distinguishing two sub-series of the men according to whether they had pain in limbs (mild or severe) in the same runs or not; (4) age distributions for three sub-series of the men, distinguishing grades of severity of their reactions; (5) data for blood pressures and pulse rates recorded immediately before, immediately after and 2 hours after first runs, distinguishing sub-series of the men on account of the severity of their reactions. (Author's summary)

Morgan, C. T. 1952
THEORY AND PROBLEMS OF RADAR VISIBILITY: INTENSITY-MODULATED SCOPES. — April 14, 1952. i+20 p. Johns Hopkins Univ., Baltimore, Md. Report no. 166-I-148 (Contract N5ori-166, Task order 1); issued by Naval Research Lab., Washington, D. C. Report no 3965 (Project no. NR-784-001) (TIP U21822).
UNCLASSIFIED

Major phenomena of detectability on the 7BP7 intensity-modulated radar screen were predicted in terms of the voltage regulation of light emission from the screen and the capacity of the eye to make brightness discriminations. The two most important factors in detectability were screen brightness and target size (less critical). A general analysis accurately predicted, in most cases, the effects obtained in experiments. While uncertain in some cases, the analysis allowed prediction of data that otherwise would be laborious to gather. (TIP abstract)

Morgan, E. H. see Nahas, G. G., 1952

Morsh, J. E. 1952
and R. A. Swanson
THE RELATION OF TECHNICAL KNOWLEDGE AND OTHER VARIABLES TO RATINGS OF INSTRUCTOR COMPETENCE. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. TECH 52-1, April 1952. 6 p. (ATI 152 536).
UNCLASSIFIED

The study attempts to determine the extent to which variances found in supervisors' ratings of instructors may be accounted for by technical knowledge of subject matter, military rank, Army General Classification Test scores, teaching experience, and Technical Specialty Aptitude Index (TSAI) scores. Competence ratings of instructors were determined by the "forced choice" technique and by ratings obtained from supervisors. Technical proficiency was measured by using the Airplane Power Plant Mechanic Proficiency Examination 101X-2. Positive correlations of these tests with the above criteria were determined.

Moses, L. E. see Burkhardt, W. L., 1952

Moss, W. M. 1952
THE AIR-LINE PILOTS LOOK AT SAFETY. — Aeronaut. Eng. Rev., 11 (4): 46-51, 66. 1952.
DLC (TL501.A326 v. 11)

The interrelationships of airplane accident rate, pilot error, and outside factors such as airplane design, operational features, air traffic regulations, and pilot training are investigated. Although the accident rate has decreased from 48 to 10 per 100 million miles (fatal accidents from 8 to 1.5) between 1938 and 1950, the chances are still 3 out of 4 that an airline pilot will be involved in an accident during his career (as of 1951). Interconnection of safety features, such as linking together of landing gear and flap lever operation, as well as further development of human engineering features (e.g. simplification of instrument panels) and warning devices is recommended.

[Moss, W. W.] 1952a
VETERAN PILOT OFFERS 3 SUGGESTIONS FOR REDUCING HAZARDS OF FLYING. — New

York Times, Feb. 10, 1952, section II: 25 (col. 3-4). 1952. DLC

Review, by F. Graham, of an address on airplane safety as correlated to pilot error, delivered by William W. Moss, a pilot of Pan American World Airways. In 50% of all accidents, the blame has been placed on the pilots with disregard of other underlying factors, such as inadequate instrumentation. The following suggestions were made by Mr. Moss for the sake of greater safety: (1) interconnection of landing gear and flap lever mechanisms to prevent lowering of flaps beyond take-off position unless the gears are down (during Mr. Moss's 14-year study of airline safety, he has found that 47 accidents could be attributed to misuse of landing gear); (2) mandatory use of reverse-pitch propellers (in the above period, 62 accidents were caused by planes running beyond field boundaries); and (3) installation of terrain clearance indicators to prevent crashes into mountains and other high obstacles (25% of all fatalities were caused by this type of accident).

Muller, B. see Deschwanden, J. von, 1952

Muller, H. J. 1952
GENETIC EFFECTS OF COSMIC RADIATION. — In: Physics and medicine of the upper atmosphere: a study of the aeropause, p. 316-330. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico Press, 1952.
DLC (RC1050.U5, 1952)

A detailed review of past genetic studies of X-ray and cosmic radiation, and experiments conducted with Drosophila and mice, lead the author to the conclusion that the gene mutational effects of relatively short exposures to cosmic radiation would be negligible in comparison to the great potential value to mankind of the operations leading to such exposure. Any genetic damage (mutational load) would be so dispersed among future decendants so as to effect only a minute fraction of the population. While it is impossible to predict mutational processes in humans over a number of generations, all precautions should be taken to avoid exposure to cosmic radiation.

Murga, J. M. see Murga, R. H., 1952

Murga, R. H. 1952
and J. M. Murga
[ACOUSTIC INJURIES IN ARMED FORCES PERSONNEL] Traumatismos acústicos producidos en el personal de las Fuerzas Armadas. — Revista de la sanidad militar argentina (Buenos Aires), 51 (2): 207-219. 1952. In Spanish. DLC (RC970.R4, v. 51)

Studies on the amount and nature of hearing damage caused by explosive detonations and jet airplane noises are summarized. Experiments carried out by R. Ruedi and W. Furrer are reviewed. These two authors measured jetplane noises (with the engine idling and at high speed) at the following points: near the intake at the nose of the airplane, in the cockpit, and at the rear section of the fuselage. While the pilot was found to be comparatively protected against noise damage by earphones, helmet, and canopy, the ground personnel was exposed to noise levels against which earplugs did not offer sufficient protection. Specially designed rubber helmets, however, proved to give adequate protection. Test subjects exposed to a compressor noise of 124 decibels at 850 cycles per minute (c.p.m.) for 10 minutes and given audiograms after 20 minutes, showed hearing losses in the 500 to 8000 c.p.m. range, which subsided after 24 hours.

Nahas, G. G. 1952
E. H. Morgan, and E. H. Wood
OXYGEN DISSOCIATION CURVE OF ARTERIAL BLOOD IN MEN BREATHING HIGH CONCENTRATIONS OF OXYGEN. — Jour. Applied Physiol., 5 (4): 169-179. 1952.
DLC (QP1.J72, v. 5)

The correlation between arterial oxygen saturation and arterial oxygen tension was determined in 10 subjects breathing consecutively gas mixtures containing about 40, 50, 60, 100, 70, and again 100% oxygen. Complete oxygen saturation of hemoglobin in arterial blood was reached when the oxygen tension was 400 mm. Hg. This tension was attained by inhaling oxygen-nitrogen mixtures containing 70% or more oxygen, at a body temperature of about 37°C and an arterial CO_2 tension of approximately 40 mm. Hg. The possible presence of an inactive pigment (e.g. methemoglobin), which at high oxygen pressure might be converted to oxyhemoglobin, was ruled out on the basis of further experiments.

Nahas, G. G. see also Hemingway, A., 1952, 1952a

Nardin 1952
[ON THE EFFECTS OF THE CLIMATIC FACTORS OF THE FAR EAST ON THE PHYSICAL AND PSYCHOLOGICAL CONDITION OF THE FLYING PERSONNEL] Considérations relatives au retentissement des facteurs climatiques d'Extrême-Orient sur l'état physique et psychique du personnel navigant de l'aviation. — Revue médico-chirurgicale des forces armées d'Extrême-Orient [Saigon], 1 (3): 1-24. 1952. In French.
DSG (W1 RE937, v. 1)

In a tropical climate, changes of body temperature are due to both chemical and physical factors. Peripheral vasodilatation which occurs at high environmental temperatures deprives the major organs of their regular blood supply. The basal metabolism is usually 10% lower than normal. As the quantity of daily sweat may be 4-5 liters, the sodium chloride intake has to be adjusted. In the process of acclimatization, three periods may be distinguished. The first period, lasting usually 2-3 months, is characterized by minor hepato-intestinal reactions (painful spasms of the voluntary muscles after exertion, and slowing down of the liver function); slight modifications

in the neurocirculatory balance (tachycardia) may be noted. In the second period, from about the 3rd to the 12th month, the organism is adapting itself successfully, provided its resistance is adequate. The third period, when complete acclimatization is reached, may last 2-3 years. — In case the organism does not have sufficient resistance to adapt itself successfully, fatigue, tropical anemia (inducing hypoxia) and changes in the leukocyte and eosinophil balance may occur. Further complications may arise, such as cardiac instability, reflex disorders, psychoneuroses, and amebiasis due to the handling of food by infected native servants.

(Naval Air Test) 1952
EVALUATION OF EXPERIMENTAL JETTISONABLE TYPE PARACHUTE HARNESSES. — Naval Air Test Center, Patuxent River, Md. [Serial no.] ST34-101, Sept. 8, 1952. 9+3 p. (Project TED no. PTR-AE-525025; TIP U24112). UNCLASSIFIED

The parachute harnesses tested were of two designs. The C design was a USAF-type harness modified by the incorporation of AN hardware. The canopy releases formed the attachment between the main sling of the harness and the canopy lift webbing. The D design was similar to the back-pack parachute harness now in service use, except canopy releases replaced shoulder adapters. The length of the main sling and the shoulder straps was made adjustable by two friction adapters each. Types C and D were worn on 66 and 101 flights and evaluated by 21 and 25 pilots, respectively. It was recommended that these two designs not be accepted for service use, because the method and range of adjustments are not suitable, the pressure to actuate the canopy releases is excessive, there is interference with personal equipment, and they are both difficult and time-consuming to don. (TIP abstract)

(Naval Med. Res. Lab.) 1952
REQUIREMENTS FOR GENERAL PURPOSE SUNGLASSES FOR OVER-THE-COUNTER SALE. — Naval Medical Research Lab., New London, Conn. Memorandum report 52-6, April 4, 1952. 3 p. (Project no. NM 003 041.51; TIP U22041). PB 106885

The following requirements for sunglasses to be used by naval personnel were adopted: 12-25% transmission of visible light; 10% average transmission of light in the ultra-violet range; the color to be essentially neutral (excitation purity not to exceed 25%); lens size should be sufficient to provide adequate protection; the refractory power of the lenses, as measured at the center, should not exceed .08 diopters; the glass or plastic should be free from visible defects; and the frames should be sturdy and well-fitting.

Neely, K. K. 1952
and D. K. Vanderwater
NOISE LEVELS IN A STANDARD RCAF NORTH STAR AIRCRAFT. — Defence Research Medical Labs. (Canada), Toronto, Ontario. DRML Report no. 27-1 (Final), April 1952. ii+21 p. (DRML Project no. 27-40-70; ATI 164 371) UNCLASSIFIED

An assessment of the noise levels in a Standard R. C. A. F. North Star Aircraft was made following a request for such a study by the R. C. A. F. Institute of Aviation Medicine. During take-off the overall noise level in the centre of the passenger compartment opposite window 1, averaged 126 decibels, while six inches from window 1, it was 132 decibels. The noise in the passenger compartment, measured during cruising, varied from 119 decibels at the front windows to 114 decibels at the rear windows. The overall noise level in the flight deck, during cruising, varied from 104 decibels to 106 decibels, while in the passenger compartment it varied from 110 to 112 decibels at the centre positions. It is indicated that the noise levels in the passenger compartment of the North Star exceed the maximum noise levels permissible for the safety of the ear, prevention of accidents, and personal comfort. (Authors' summary)

Neely, K. K. see also Hall, F. G., 1952

Neĭfakh, E. A. 1952
[INTRALABYRINTHINE PRESSURE AND THRESHOLDS OF THE AURAL SENSITIVITY TO ATMOSPHERIC PRESSURE IN NONSUPPURATIVE PATHOLOGICAL PROCESSES] Vnutrilabirintnoe davlenie i porogi barochuvstvitel'nosti ukha pri sukhikh patologicheskikh protsessakh. — Vestnik oto-rino-laringologii (Moskva), 14 (3): 17-21. 1952. In Russian. DLC (RF1.V4, v. 14)

The auditory thresholds for tones of various pitch were studied by means of a telephone membrane built into an ear plug. Increasing the air pressure in the external auditory canal altered the thresholds for the various parts of the auditory spectrum unevenly. In healthy subjects, a pressure increase of 2.5-3.2 mm. Hg. increased the thresholds for tones of 500-1500 c.p.s.; tones of 50 c.p.s. and 6000 c.p.s. were affected by higher pressures, 6.2 and 8.7 mm. Hg, respectively. Similar measurements were made also on patients with suppurative or nonsuppurative otitis media.

Neil, E. see Duke, H. N., 1952
Neverre, G. see Malmejac, J., 1952b, 1952d
Newman, R. B. see Bolt, R. H., 1952

Newman, R. W. 1952
MEASUREMENT OF BODY FAT IN STRESS SITUATIONS. — Quartermaster Climatic Research Lab., Lawrence, Mass. Environmental Protection Branch report no. 193, Nov. 1952. 18 p. ([Project no.] 64-02-001; AD 2579). UNCLASSIFIED

The skin-fold technique described by Brozek and Keys (Brit. Jour. Nutrition, 5: 194, 1951) was used in two experiments, one involving prolonged heat exposure and the other the consumption of a survival ration. For the first experiment, 5 men were kept in an air-conditioned

room at 75°F for 3 weeks, at 120°F during the day and 100°F at night for 2 weeks, and then at 75°F for 10 days. The men were placed on a rigid schedule of activity. The 10 men in the survival-ration experiment were kept in an air-conditioned room at 80°F for 13 days and were fed C-rations. For the next 10 days in the same room and temperature, the subjects were given survival rations only. Their activity was regulated. Data on body weight, body fat, caloric intake, and water intake were recorded and analyzed for each experiment. The high fat values obtained in the heat study may have been caused by a peripheral vasodilatation. Body weight was influenced by the quantity of water consumed. In the absence of heat stress, the skin-fold method for estimating body fat gave excellent results. The weight loss of the subjects in both experiments was closely accounted for in terms of the adipose and protein tissue losses. (AD abstract)

Newsom, B. D. see Kimeldorf, D. J., 1952, 1952a, 1952b

Nicolas 1952
[THE RELATIVE FREQUENCY OF OLIGO-SYMPTOMATIC FRACTURES OF THE BODIES OF VERTEBRAE AFTER AVIATION ACCIDENTS AND MISHAPS: VALUE OF THEIR SYSTEMATIC DETECTION] De la fréquence relative des fractures oligo-symptomatiques des corps vertébraux au cours des accidents et des incidents d' aviation. De l'intérêt de leur dépistage systématique. — Médecine aéronautique (Paris), 7 (4): 354-358. 1952. In French.
DLC (TL555.M394, v. 7)

Apart from fatal accidents, physicians of air bases frequently encounter minor accidents. All persons involved in an accident are submitted to a thorough medical examination. It may happen, however, that due to the busy schedule of the air-base physician certain disorders are not detected in time. Ten cases involving some kind of concealed fracture of the corpus of vertebrae are discussed. The medico-legal implications of remote sequelae of fractures are emphasized as it is hard to trace their etiology when the clinical or X-ray findings are not characteristic enough.

Nielsen, M. 1952
and Helge Smith
STUDIES ON THE REGULATION OF RESPIRATION IN ACUTE HYPOXIA; WITH AN APPENDIX ON RESPIRATORY CONTROL DURING PROLONGED HYPOXIA. — Acta physiologica scandinavica (Stockholm), 24 (4): 293-313. 1952. In English. DSG

In order to determine the effect of CO_2 on pulmonary ventilation during hypoxia, two subjects breathed mixtures of oxygen, nitrogen, and carbon dioxide, with the partial pressure of O_2 adjusted so as to keep the alveolar O_2 level constant in the various hypoxic stages. CO_2 breathing in the hypoxic state did not affect pulmonary ventilation until a certain threshold value of alveolar pCO_2 was reached. Beyond the threshold value an increase in pCO_2 had a greater effect than under normal conditions. The threshold value was found to be constant at the various stages of hypoxia and is therefore believed to be identical with the CO_2 threshold of the respiratory center. In an attempt to explain the mechanism of acclimatization to low O_2 pressure, the authors assume that the low O_2 pressure during acclimatization causes a primary increase in ventilation due to an increased activity of the center. In prolonged hypoxia the CO_2 threshold is decreased.

Niess, O. K. 1952
REPORT BY IG. — U. S. Air Force Medical Serv. Digest, 3 (9): 12-13. 1952.
DSG (W2 A403u, v. 3)

The author, who is a member of the staff of the U. S. Air Force Inspector General, discusses the aircrew effectiveness program. The flight surgeon's role in this program is outlined and the reflection of his performance on personnel morale is stressed. The author recommends rotation of flight surgeons between the front lines (Korea) and the rear to give them an opportunity to familiarize themselves thoroughly with specific field missions and evacuation practices.

Niven, J. I., 1952
W. Johnson, G. W. Rand, and W. A. Pettit
EVALUATION OF A MODIFIED VERHOEFF STEREOPTER. — Naval School of Aviation Medicine, Pensacola, Fla. Aug. 1, 1952. 10 p. (Project report no. NM 001 057.09.01; TIP U24914). UNCLASSIFIED

The Verhoeff test of depth perception was administered on each of two occasions to 100 patients and volunteers at an eye clinic. On each occasion two forms of the test were used: the standard instrument held in the hand of the tester, and a modified apparatus mounted on a rigid framework. The test-retest reliabilities on the basis pass-fail scoring were 0.75 and 0.80, respectively, for the standard and modified versions of the apparatus. Neither form showed a marked superiority over the other. (TIP abstract)

Niven, J. I. see also Graybiel, A., 1952c, 1952d; Guedry, F. E., 1952a
Noell, W. K. see Luft, U. C., 1952a

(Noise—causes, effects) 1952
NOISE—CAUSES, EFFECTS, MEASUREMENT, COSTS, CONTROL. — (Lectures presented at the Inservice Training Course on the Acoustical spectrum; sound—wanted and unwanted. Feb. 5-8, 1952.) 192 p. Ann Arbor, Mich.: Univ. of Mich. Press, 1952. DLC (RA772.N7M5)

This is a series of lectures given at a symposium on sound, held at Ann Arbor, Mich., Feb. 5-8, 1952, and sponsored by the University of Michigan School of Public Health and the Institute of Industrial Health, Ann Arbor, Mich. Of the papers contained in this symposium, the following deal with the physiological aspects of noise and have been abstracted separately:

Anson, B. J., 1952
Glorig, A., 1952
Goldman, D. E., 1952a
Guild, S. R., 1952a

Kobrak, H. G., 1952
Kryter, K. D., 1952a
Parrack, H. O., 1952a
Sterner, J. E., 1952a

Norris, R. C. see Thorndike, R. L., 1952

Numeroso, N. 1952
[INTEREST IN FLYING AND SOCIOMETRIC CHARACTERISTICS] Interessi per il volo e caratteristiche sociometriche. — Rivista di medicina aeronautica (Roma), 15 (2): 261-273. 1952. In Italian, with English, French, Spanish, and German summaries (p. 270).
DLC (T555.A1R5, v. 15)

By means of a questionnaire, information was obtained from 21 pilots about the motives which induced them to select their profession. The sociometric characteristics of this group were already known from data based on Moreno's test. The results (not too significant statistically because only few people were tested) show certain variations in the involvement of the ego and the technical, economical, and social interests as compared to the results of Moreno's sociometric tests.

Nungesser, F. L. see Alluisi, E. A., 1952b

Oberst, F. W. see Comstock, C. C., 1952
Oestreicher, H. L. see Gierke, H. E. von, 1952
Özer, F. see Terzioğlu, M. N., 1952, 1952a, 1952b

(Off. Tech. Services) 1952
BIBLIOGRAPHY OF REPORTS ON VIBRATION. — Office of Technical Services, Washington, D. C. Report IB-225, July 1952. 10 p. DC

This bibliography is primarily concerned with the technical aspects of vibration; it contains a number of references dealing with its physiological effects.

Ogle, D. C. 1952
NEW CONCEPTS IN AVIATION MEDICINE. — Military Surgeon, 110 (2): 87-91. 1952.
DLC (RD1.A7, v. 110)

The first part of the paper is dedicated to a brief review of the advances and problems of aviation medicine. Aviation medicine is not—as it is widely believed—a "general practice" type of medical endeavor; it is a science and a profession in its own right, tying together a variety of branches of medical and related natural sciences as well as engineering and such remote fields as astronomy and meteorology. — In the second part the author discusses briefly, but in more detail, techniques developed recently to determine the effects of aging on flight personnel. A laboratory method is discussed for measuring the degree of physiological aging by making use of the correlation between the cholesterol content of the blood and arteriosclerosis (atheromatosis). In conclusion, periodical, standardized, and exhaustive physical tests of pilots and airplane crews are recommended.

Older, H. J. see Hill, J. H., 1952, 1952a

Olmstedt, J. M. D. 1952
FATHER OF AVIATION MEDICINE (PAUL BERT). — Scient. Amer., 186 (1): 66-68, 70, 72.
DLC (T1.S5, v. 186)

This short bibliographic study of the French physiologist Paul Bert contains a description of Bert's low-pressure chamber experiments and of the two baloon ascents undertaken by J. E. Crocé-Spinelli, H. T. Sivel, and Gaston Tissandiers. Included are also excerpts from Tissandiers' report on the second ascent (to an altitude of 26,300 feet), in which his two companions lost their lives.

O'Neill, T. A. see Parr, W. H., 1952

Opitz, E. 1952
[HYPERTROPHY OF THE VESSELS OF THE RETINA DURING CHRONIC HYPOXIA IN THE RABBIT] Hypertrophie der Retinagefässe während chronischer Hypoxie beim Kaninchen. — Pflügers Archiv für die gesamte Physiologie, 254 (6): 549-556. 1952. In German.
DLC (QP1.A63, v. 254)

Rabbits were acclimatized to simulated altitudes of 27,000 feet or less, over periods of several weeks. The retinae of their eyes were then examined microscopically; a hypertrophic condition of the blood vessels and an increase in capillary loops were observed. Artificial restoration of normal hemoglobin concentration (relative anemia) in another group of acclimatized animals, by removing blood and re-injecting plasma, did not cause noticeable changes in the retina. Artificial induction of acute polycythemia in normal rabbits (by injection of erythrocytes into the auricular vein) likewise failed to produce the hypertrophic pattern observed in the acclimatized animals.

Opitz, E. 1952a
and H. Saathoff
[SURVIVING TIME OF THE PRIMITIVE GASPING CENTER IN VARIOUS SPECIES OF WARM-BLOODED ANIMALS BEFORE AND AFTER ACCLIMATIZATION TO ALTITUDE] Überlebenszeit des primitiven Schnappatmungszentrums bei verschiedenen Warmblüterspecies vor und nach Höhenakklimatisation. — Pflügers Archiv für die gesamte Physiologie (Berlin), 255 (6): 485-491. 1952. In German.
DLC (QP1.A63, v. 255)

The heads of mice and guinea pigs react to decapitation with gasping movements ("Schnappatmung") which persist for some time. The duration of these movements (i.e. survival of the corresponding nerve center) is longer in animals which have been exposed to simulated altitudes of 2,500 to 8,000 m. for 80 days, than it is in unexposed controls.

Otis, A. B. see Clark, R. T., 1952

Owston, J. 1952
ROCKET PROPELLANTS: THEIR TOXIC EFFECTS, HAZARDS AND FIRST AID. — Jour. Royal Army Med. Corps (London), 98 (3): 157-169. 1952.

Rocket propellants are composed of an oxidant (nitric acid, hydrogen peroxide, liquid oxygen, etc.) and a fuel (kerosene, methanol, etc.). Inhalation of nitrogen oxides may cause severe symptoms and terminate in death within 5-8 hours; the degree of susceptibility varies with the individuals. Acid skin burns may be followed by shock, but are not associated with toxic absorption. When ingested, nitric acid causes severe burns of the intestinal tract; death usually occurs within 12-14 hours. Inhalation of concentrated hydrogen peroxide has no serious effects. Splashes on the skin and eyes may, however, cause severe corneal damage and lead to blindness. The effects of liquid oxygen are very similar to those of hydrogen peroxide. Inhalation of hydrazine gives rise to mild respiratory disturbances. The liquid is toxic to the skin and eyes; immediate removal by washing is indicated. Inhalation of methanol vapor has an injurious effect on the central nervous system. The symptoms (weakness, nausea, abdominal pain, dimness of vision) are delayed for 9-36 hours. The symptoms are almost immediate, however, upon ingestion. Kerosene does not develop a sufficient amount of vapor to cause toxic symptoms at normal temperatures because of its low volatility. Methods of first aid treatment of the various toxic symptoms are summarized.

Pace, N. see Cook, S. F., 1952

Packard, J. M. 1952
and A. Graybiel
CARDIOVASCULAR PROBLEMS IN AVIATION MEDICINE: EVALUATION OF HEART MURMURS. — Jour. Aviation Med., 23 (1): 24-32, 86. 1952. DLC (TL555.A1A4, v. 23)

The evaluation of heart murmurs in aviation personnel is discussed in detail. The analysis includes timing, intensity, character, location, transmission, and constancy of murmurs, changes with body position, respiration, and exercise, and associated phenomena. An evaluation is given of the significance of heart murmurs in 470 cases referred to the authors: the murmurs were "innocent" in 69%, pathological in 17%, questionable in 6%, and absent in 8% of the cases.

Packard, J. M. 1952a
and A. Graybiel
TEN YEAR FOLLOW-UP STUDY OF ONE THOUSAND AVIATORS. — Naval School of Aviation Medicine, Pensacola, Fla. March 12, 1952. 7 p. (Project report no. NM 001.057.05.01; TIP U22473). UNCLASSIFIED

A medical follow-up was made on a portion of the 1056 men originally examined in 1940 and 1941 at Pensacola, Fla. The subjects in the original study were officers, cadets, and enlisted men undergoing flight training. The methods of identifying and locating the survivors of the original group and the experimental procedures for the follow-up examination are discussed. Of the 1056 men in the original group, 212 are known to be dead. Of the 815 survivors to whom questionnaires were sent, 801 replied. To date, 301 have been given physical examinations. The present project is designed to estimate the current physical status of these men with particular emphasis on the cardiovascular system. (TIP abstract)

Packard, J. M. 1952b
TEN YEAR FOLLOW-UP STUDY OF THE PHYSICAL STATUS OF 1000 AVIATORS. A STUDY OF THE DEATHS OCCURRING IN THE PAST TWELVE YEARS. — Naval School of Aviation Medicine, Pensacola, Fla. Nov. 25, 1952. 10+10 p. (Project report no. NM 001 057. 05. 02; AD 2594) UNCLASSIFIED

More than 99% of a group of 1056 naval aviators and flight students were traced twelve years after they had taken part in the "Pensacola Study of Naval Aviators". Of these men, 220 (21%) died during the twelve-year period. One hundred thirty deaths were caused by aircraft accidents and 62 occurred in air combat, 16 were the result of non-aviation combat, 7 the result of disease, 4 the result of non-aviation injuries, and in 1 case the cause could not be determined.

The mortality rates for instructors, successful students, and students who failed flight training are compared. The death rates for the 853 naval aviators in the group are shown to be similar to all naval aviators during the war years, and 7 1/2 times higher than the war-time rates for all non-flying Navy and Marine Corps officers. Since the end of World War II, the death rates in each group have become smaller, but the increased hazard of aviation is still apparent. Death rates (excluding combat) in the group under study are found to be nine times higher than for persons of the same age range in the general population, with the difference due entirely to risk to death in aviation accidents. (Naval School of Aviation Medicine abstract, modified)

Parr, W. H., 1952
V. M. Daggs, T. A. O'Neill, and S. G. Bush
A STUDY OF COMBINED THERMAL RADIATION BURN AND X-IRRADIATION EFFECTS ON MICE. — Army Medical Research Lab., Fort Knox, Ky. Report no. 94, Sept. 4, 1952. 8 p. (AMRL Project no. 6-59-08-013; AD 5467). UNCLASSIFIED

Mice exposed to both total body X-irradiation (720 r) and thermal radiation burns (non-lethal) succumb more rapidly than animals receiving X-irradiation only. The mice were burned either immediately before or immediately after irradiation with the over-all result being approximately the same. The possible reasons for the earlier and higher mortality of the mice receiving both X-irradiation and non-lethal burns are discussed. (From the authors' abstract)

Parrack, H. O. 1952
ULTRASOUND AND INDUSTRIAL MEDICINE. — Indus. Med. and Surg., 21 (4): 156-164. 1952. DSG

A great number of pathological reactions, such as neuromuscular incoordination, nausea, fatigue, and headache have been attributed to ultrasonic exposure, particularly in connection with jet flight and jet engine industries. Fears of lethal effects of ultrasonic exposure have been partly confirmed by animal experiments (rats, guinea pigs, etc.). Death of animals was primarily due to overheating produced by absorption of sound energy by the animals' fur. Experiments conducted with shorn animals showed that exposure time could be considerably increased at equal sound pressure levels (measured in decibels) before death occurred. This can be attributed to the much higher sound absorption coefficient of fur as compared to the uncovered skin. In humans, the lethal effect is further decreased because of great overall body surface. The distance from the ultrasonic source under normal working or flying conditions also mitigates the damaging effect of the sound waves because of attenuation by the air. Prolonged exposure to ultrasound and high noise fields, is, however, hazardous (ear injuries and other disturbances of physiological functions), and protective measures are indicated. The history of ultrasound research and questions of industrial, therapeutic, and diagnostic applications are discussed.

Parrack, H. O. 1952a
ULTRASOUND AND INDUSTRIAL MEDICINE. — In: Noise—causes, effects, measurement, costs, control, p. 45-53. Ann Arbor, Mich.: Univ. of Mich. Press, 1952. DLC (RA772.N7M5)

Same as the paper, Parrack, H. O., 1952.

Parrack, H. O. see also Gierke, H. E. von, 1952, 1952a, 1952b

Payne, B. A., 1952
E. W. Moore, and J. L. Bethurum
THE EFFECTS OF CERTAIN MOTION SICKNESS PREVENTIVES UPON PSYCHOLOGICAL EFFICIENCY. — School of Aviation Medicine, Randolph Field, Tex. Aug. 1952. 23 p. (Project 21-32-019, Report no. 1; TIP U24710).
UNCLASSIFIED

The effects of selected drugs (hyoscine, dramamine, benadryl, and benadryl-hyoscine) upon a wide variety of psychological processes were systematically explored by standardized testing techniques. These drugs differed in regard to their relative capacities to produce decrements in test behavior, and the order of the effect agreed with the order of protective capacity against motion sickness. The drugs uniformly impaired implicit more than explicit processes. Palliation without impaired performance seemed best achieved with hyoscine. (TIP abstract)

Payne, R. B., 1952
F. H. Rohles, and B. B. Cobb
THE PILOT CANDIDATE SELECTION RESEARCH PROGRAM. IV. TEST VALIDITIES AND INTERCORRELATIONS. — School of Aviation Medicine, Randolph Field, Tex. Jan. 1952. 25 p. (Project no. 21-29-008, Report no. 4; TIP U21717).
UNCLASSIFIED

Validities, reliabilities, intercorrelations, and distributions relating to officer candidate selection are given for the results from 69 tests administered to 2106 midshipmen. The statistical analysis is discussed in terms of using the information to predict the performance of other groups of officer candidates, particularly airplane pilots. There was little evidence that multiple scoring of a psychomotor task increased the predictability of the criterion variable. (TIP abstract)

Peiss, C. N., 1952
W. C. Randall, and A. B. Hertzman
RELATIONS OF HYDRATION OF THE SKIN TO THE REPENETRATION OF WATER, SWEATING AND EVAPORATION: A PRELIMINARY REPORT. — Dec. 1952. iii+13 p. St. Louis Univ. School of Medicine, Mo. (Contract AF 18(600)-96; issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. AF Technical report no. 6680, part 10 (RDO no. 696-69) (AD 6897).
UNCLASSIFIED

A study was made of the relation of skin hydration to insensible perspiration and to active sweat secretion on the hands and feet. The water uptake of the skin was studied in immersion experiments and by the gravimetric determination of weight changes in water-filled capsules sealed to the skin. The water uptake consisted largely of hydration of the epithelium and was greater on the palm and sole than on the forearm skin, which suggested a direct relation with cornification of the skin. The hydration of the epithelium increased the rate of water evaporation and inhibited sweating on the palm and sole. The amount of this inhibition was directly related to the amount of hydration. (AD abstract)

Peköz, N. see Terzioğlu, M. N., 1952a, 1952b

Pengelley, C. D. 1952
MODEL TESTING TECHNIQUES FOR INVESTIGATING JETTISONING OF EVACUATION CAPSULES FROM SUPERSONIC AIRCRAFT. — Southwest Research Inst., San Antonio, Tex. 1952. 14 p. [Paper presented at Conference on Problems of Emergency Escape in High Speed Flight, Sept. 29-30, 1952, at Wright-Patterson Air Force Base, Ohio] (AD 14 341).
UNCLASSIFIED

A study has been made of model testing techniques that may be used to investigate the characteristics of jettisonable capsules for evacuation from high-speed aircraft up to speeds of Mach 3.5. — Dimensional theory has been presented and, unless the speed of sound can be controlled, complete similarity cannot be achieved between model and full scale. Practical working compromises have been presented. — Captive wind tunnel models, and also free flight models have been studied, both ground-launched from a track and air-launched from an aircraft at high altitude. (Author's summary)

Pera, G. 1952
[DEVELOPMENT AND PRESENT ASPECTS OF PSYCHOLOGY APPLIED TO AVIATION] Evoluzione ed aspetti attuali della psicologia applicata all' aviazione. — Rivista di medicina aeronautica (Roma), 15 (2): 193-211. 1952. In Italian, with English, French, Spanish, and Germany summaries (p. 207-211).
DLC (TL555. A1R5, v. 15)

The present developments in aviation techniques necessitate a careful selection of pilots. The Italian aviation has been a pioneer in this respect since World War I.

In reconsidering the selection of pilots, the following factors are of prime importance: (1) a high degree of technical mathematical background, necessary to learn the various problems of air navigation; (2) stability, emotional control and a high I. Q.; (3) good psychomotor reactivity. Both the physical and mental examinations should be carried out with special care; the person in charge should have a wide knowledge of psychological techniques, evaluating the entire personality of the candidate, and analyzing phases of his life prior to his admission to the school of aviation.

Peres, G. see Cordier, D., 1952

Pernet, A. 1952
[PREVENTIVE SURGERY IN SEQUELAE OF AIR ACCIDENTS] Cirurgia preventiva das sequelas post-traumáticas em aviação. — Revista médica da aeronáutica (Rio de Janeiro), 4 (2): 33-46. 1952. In Portuguese.
DSG (W1 RE609, v. 4)

The fundamental principles of surgical rehabilitation following airplane accidents are discussed. Preoperative examination, care of surgical instruments, hemostasis, planning of surgical incision, and postoperative measures are analyzed in detail. Methods of heteroplastic and autoplastic skin transplantation are illustrated with various examples.

(Personnel Res. Board) 1952
STUDIES IN AIRCREW COMPOSITION. STUDY NO. 2, PART I. THE USE OF THE ROTTER INCOMPLETE SENTENCES BLANK IN THE PREDICTION OF AIR CREW ADJUSTMENT. — June 1952. ix+18 p. Ohio State Univ. Personnel Research Board, Columbus [Contracts AF 33(038)10105 and AF 18(600)67]; issued by Human Resources Research Labs., Bolling Air Force Base, D. C. HRRL Memo Report no. 24 (TIP U24910). UNCLASSIFIED

A special manual was developed for scoring the completions made to Rotter's Incomplete Sentences Blank. The resulting score was believed indicative of the individual's general adjustment to membership in a combat air crew. A cross-validation of the scoring method yielded a validity coefficient of 0.40. Studies indicated that crew members who proceeded to combat assignments with their original crews had better crew-adjustment scores than those who did not go into combat. Scores were poorer for crew members who were removed from flying status than for those who performed satisfactorily in combat. Crew-adjustment scores were not related to superiors' ratings of the individual's combat performance, but were better for crew members with favorable sociometric ratings. The attitudes of crew members toward remaining on flying status were related to the crew-adjustment scores. (TIP abstract)

Peterson, A. C. 1952
USAF CRASH RESCUE TRAINING. — National Fire Protection Association. Committee on Aviation and Airport Fire Protection, Boston, Mass. Bulletin no. 85, June 1952. 8 p.

Fire-fighting training given at Lowry Air Force Base (Department of Fire-Fighting and Crash Rescue Training) is described. Following a course in the fundamentals of fire-fighting, courses are presented in the operation, inspection, and maintenance of pumpers, and in the techniques of combating interior and exterior fires, including gasoline tank, automible, and natural-cover fires. The various fire-fighting agents are studied in detail. Attention is given to special problems, such as fires involving jet fuels, oxygen containers, and oxygen-pressurized cabins.

Peterson, V. A. 1952
FLIGHT FATIGUE AND VENTILATION. — Air Line Pilot, 1952 (June): 5, 13. 1952.

The author reviews briefly the principal factors causing inadequate ventilation in the pilot's compartment and the passenger cabin, such as recirculation of insufficiently purified air, excessive CO concentration from cigarette smoke, etc. On the basis of his own experience he recommends the establishment of reasonable ventilation standards by the Civil Aeronautics Administration. Aircraft should be equipped with indicator devices showing the purity of the air, and the flow of air should be from the front to the rear of the airplane to facilitate smoke removal (.002% of CO is considered to be the critical value for flights lasting 4 hours or less at altitudes of 5,000 feet or below).

Pettit, W. A. see Niven, J. I., 1952

Phillips, R. B. 1952
and D. L. McKee
THE IDENTIFICATION AND HANDLING OF THE DEAD. — U. S. Armed Forces Med. Jour., 3 (9): 1341-1346. 1952. DSG (W1 UN3318, v. 3)

Methods and procedures of identifying the remains of aircraft accident victims are discussed for the benefit of flight surgeons. An autopsy will have to be performed whenever there is any doubt as to the cause of death. The part played in crashes by various safety devices (belts, harnesses, helmets, oxygen equipment, seats, etc.) will

be of great interest. Study of the body with regard to the stage of rigor mortis may provide an important clue as to the approximate hour of death. The importance of an accurately charted dental record, as a means of identifying the dead, is stressed. Dental abnormalities instrumental in facilitating identification are listed.

(Physics and Medicine) 1952

PHYSICS AND MEDICINE OF THE UPPER ATMOSPHERE: A STUDY OF THE AEROPAUSE. — xxiv+611 p., 46 pl. Ed. by Clayton S. White and Otis O. Benson. Albuquerque: University of New Mexico Press, 1952.
DLC (RD1.1050.U5, 1952)

The proceedings of a symposium on the physics and medicine of the upper atmosphere are presented, held at San Antonio, Texas, November 6-9, 1951, and sponsored by the Air University School of Aviation Medicine, Randolph Field, Texas. The following individual papers, dealing with aviation medicine, have been abstracted separately:

Buettner, K., 1952a, 1952b
Campbell, P. A., 1952
Christy, R. L., 1952
Cibis, P. A., 1952c
Evans, T. C., 1952
Graybiel, A., 1952a
Haber, H., 1952e, 1952g
Krebs, A. T., 1952, 1952a
Luft, U., 1952
Mayo, A. M., 1952a
Muller, H. J., 1952
Regener, V. H., 1952
Specht, H., 1952
Strughold, H., 1952c
Talbot, J. M., 1952
Taylor, C. L., 1952
Van Allen, J. A., 1952
Whipple, L., 1952

Pickrel, E. W. 1952
CLASSIFICATION THEORY AND TECHNIQUES. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. PERS 52-60, Dec. 1952. 11 p. (Project no. 503-001-0015; AD 3226).
UNCLASSIFIED

The multiple-discriminant-function, multiple-cutting-score, unique-pattern, and multiple-correlation techniques of classification and selection of personnel are reviewed. (AD abstract)

Pickrel, E. W. see also Howard, J. K., 1952

Pierce, T. F. 1952
CLOSED LOOP CONTROLS HUMAN CENTRIFUGE. — Electronics, 25 (10): 132-134. 1952.
DLC (QC544.V3A3, v. 25)

A human centrifuge developed at the Naval Air Development Center, Johnsville, Pennsylvania, is described. In developing acceleration forces up to 40 g, it simulates stresses encountered in high-speed flight and will be used to test physiological effects of acceleration and anti-g devices (protective clothing). It consists basically of a 50-foot tubular-steel arm attached to the shaft of a 4000-hp motor, carrying at its end an oblate spheroidal gimbal-suspended gondola for the test subject. The centrifuge can be accelerated to a gondola speed of approximately 173 mph. in less than 7 seconds and decelerated at the same rate. The main accelerating motor and the two gimbal control motors are electronically controlled. Observation of the test subject is achieved with television, motion picture cameras, high-speed X-ray equipment, and special physiological sensing and measuring equipment.

Pircher, L. see Wiesinger, K., 1952
Pirodda, E. see Zwislocki, J., 1952
Pitts, R. F. see Axelrod, D. R., 1952, 1952a
Pivotti, G. see Sala, O., 1952

Placidi, T., 1952
P. Falconnet, E. Ducros, and A. Missenard
[THE ORGANIZATION OF THE INITIAL SELECTION OF FLYING PERSONNEL AND OF THE CONTROL OF THE MAINTENANCE OF FITNESS THROUGHOUT FRANCE AND THE FRENCH UNION] Organisation de la sélection initiale du Personnel navigant et du contrôle de la persistance de son aptitude sur l'étendue du territoire de la France et de l'Union française. — Médecine aéronautique (Paris), 7 (4): 359-363. 1952. In French. DLC (TL555.M394, v. 7)

The organization of the medical selection and maintenance of aviation personnel in France and its colonies is discussed in detail.

Plane, P. see Malmejac, J., 1952, 1952c

Plant, W. H. 1952
NIGHT VISION AND DARK ADAPTATION, 1946-1951: A SELECTED READING LIST. — Research and Development Board, Washington, D. C. Jan. 8, 1952. 10 p. (TIP 21019).
UNCLASSIFIED

This bibliography covers books, journal articles, and reports published between 1946 and 1951 on the subjects of night vision and dark adaptation. Publications from various foreign countries are included; foreign titles are translated into English in most cases. The individual entries are arranged alphabetically by author. 99 references.

Plas, F. 1952
[AIR TRAVEL AND HEART DISEASES] Voyages en avion et cardiopathies. — Gazette médicale de France (Paris), 59 (13): 823-824. 1952. In French. DSG

Persons suffering from compensated valvular heart conditions will not be endangered by air travel. Broken compensation cases should refrain from air travel unless absolutely necessary and should then be under continuous medical supervision; administration of oxygen may be required. Subjects suffering from noncompensated valvular

deficiencies should resort to air travel in extreme cases only and breathe oxygen at regular intervals. Congenital cardiopathies are compatible with air travel. Air travel is extremely risky and unpredictable for persons suffering from coronary conditions. Attacks may occur, not necessarily during the airborne portion of the trip, but after landing as well. Hypertension, without left ventricular insufficiency, is not affected by altitude; rapid ascents and descents should be avoided, however, and preliminary simulated altitude tests, as well as administration of cardiac tonics and of sedatives during travel may be advised. Cor pulmonale requires breathing of oxygen for 10-minute periods every half hour.

Plas, [F.] 1952a
and J. Bourdinaud
[APNEA TEST FOLLOWING FORCED EXPIRATION, TEST CONTROLLED BY BLOOD OXYMETRY (MILLIKAN'S METHOD); STUDY OF CARDIOVASCULAR REACTIONS DURING THE TEST] Le test d'apnée après expiration forcée, test controlé par oxymetrie sanguine (méthode Millikan); étude des reactions cardiovasculaires pendant le test. — Médecine aéronautique (Paris), 7 (1): 23-29. 1952. In French. DLC (TL555.M394, v. 7)

The correlation between blood oxygen saturation and pulse rate during voluntary apnea was studied experimentally on athletes, healthy persons of average physique, neuro-circulatory asthenics, and persons suffering from respiratory disturbances or neurovegetative dystonia. Blood oxygen saturation was measured by the Millikan method and the pulse rate was determined every 5 minutes. Results were plotted on curves. Patterns of oxygen saturation and pulse rates characteristic for the various groups were observed. Two basic types of cardiac response were distinguished: (1) pulse acceleration immediately following the resumption of breathing (within 3 seconds) in the healthy and well trained subjects; and (2) prolonged bradycardia in the poorly developed subjects or neuro-circulatory asthenics. The rate of resumption of normal blood oxygen saturation after termination of voluntary apnea was likewise found to be proportional to physical fitness. Thus the test can be recommended as a reliable selection method in determining physical fitness and endurance in aviation candidates.

Plotnikoff, N. P., see Chinn, H. I., 1952d

Poe, A. C. 1952
and V. W. Lyon
THE EFFECTIVENESS OF THE CYCLORAMIC LINK TRAINER IN THE U. S. NAVAL SCHOOL, PRE-FLIGHT. — Naval School of Aviation Medicine, Pensacola, Fla. March 17, 1952. 9 p. (Project report no. NM 001 058.07.01; TIP U22287). UNCLASSIFIED

Two groups of student subjects were selected at random. One group was given the regular preflight school curriculum and the other group had 5 periods of instruction in the SNJ cycloramic Link Trainer in addition to the regular curriculum. The performances of the two groups during the initial stages of flight training were compared on the following criteria: flight attritions, the number of position boards assembled to consider flight deficiences, the number of extra flights necessary for attainment of flight proficiency standards, and instructional- and check-flight grades. Differences in proficiency between the groups were not statistically significant. (TIP abstract)

Poe, A. C., 1952a
C. H. Maag, and W. Johnson
A STUDY OF THE EFFECT OF OMISSION OF RADIO FLIGHT TRAINING DURING STAGE D UPON LATER BASIC INSTRUMENT FLIGHT PROFICIENCY. — Naval School of Aviation Medicine, Pensacola, Fla. Oct. 31, 1952. 8+[4] p. (Project report no. NM 001 058.23.01; AD 1006). UNCLASSIFIED

To determine the effect of radio-range training omission during "Stage D" [of the training program] upon later basic-instrument flight proficiency, a control and an experimental group of 100 men each were selected. The control group, which had received the 5 Stage-D radio-range flights, and the experimental group, which lacked this training, were divided into high-, middle-, and low-proficiency sections on the basis of their D11 check flight grades. When subjected to a second D11 check flight, as a measure of their basic-instrument proficiency, the experimental group possessed a lower and more greatly diversified proficiency than the control group. (AD abstract)

Poe, A. C. 1952b
and R. K. Ambler
A COMPARISON OF TEST WEIGHTING TECHNIQUES FOR THE FLIGHT APTITUDE RATING BATTERY. — Naval School of Aviation Medicine, Pensacola, Fla. Oct. 30, 1952. 7 p. (Project report no. NM 001 057.04.02; AD 1007). UNCLASSIFIED

Two test-weighting methods based on the assumption that the underlying distribution of the Pass-Fail Flight criterion is normal and a third, the discriminant function technique, were used to compute composite scores from the Mechanical Comprehension and the Aerial Orientation Test Scores. Results based on 1083 passers and 189 failures indicate that the score distributions had correlations of 0.99+. It is concluded that the assumption was valid for these data and practical consideration should determine the weighting method used. (AD abstract)

Pötzl, O. see Frankl, V. E., 1952

Pollack, I. 1952
THE LOUDNESS OF BANDS OF NOISE. — Harvard Univ., Psycho-Acoustic Lab., Cambridge, Mass. Report no. PNR-126, [1952]. 9+6 p., 9 plates. (Contract N5ori-76, [Task order 2]; TIP U22333). UNCLASSIFIED

Subjective evaluation of the loudness of noise for various bandwidths, or for the loudness as a function of bandwidth, indicated that in order to produce maximal loudness it was generally more

economical to spread the noise spectrum over a wide frequency range. The ear was more sensitive to middle- than low- or high-frequency noise. (From TIP abstract)

Pollack, I. 1952a
ON THE MEASUREMENT OF THE LOUDNESS OF SPEECH. — Jour. Acoust. Soc. America, 24 (3): 323-324. 1952. DLC (QC221.A4, v. 24)

Subjective estimation of the loudness of a speech signal was studied under three conditions: (1) by adjustment of a speech signal heard in both ears until it was equal in loudness to a speech signal heard in one ear alone; (2) by adjusting a speech signal until it sounded half as loud or twice as loud as a given speech signal; (3) by matching the loudness of a speech signal with the loudness of a pure tone of 1000 c.p.s. The results are entered on 5 graphs. The greatest discrepancies were observed in the experiments under (1).

Pollack, I. 1952b
THE ASSIMILATION OF SEQUENTIALLY-ENCODED INFORMATION. I. METHODOLOGY AND AN ILLUSTRATIVE EXPERIMENT. — Air Research and Development Command. Human Resources Research Labs., Bolling Air Force Base, D. C. HRRL Memo report no. 25, Sept. 1952 (AD 19 565). UNCLASSIFIED

This paper presents a methodology for verbal learning based on the theory of information. An illustrative experiment in short-time retention was designed to fulfill the requirements of the methodology. The major finding of the study is that the encoding of the learning materials for retention is an important determiner of the amount of information which can be retained. Specifically, for messages of a given length, the percentage of information gained or lost (relative to the information presented) is independent of the informational content per message-unit. For messages of a given informational input, however, the amount of information gained is greater for short messages with a high informational content per message unit than for long messages with a low informational content per message unit. (From author's summary)

Pollack, I. 1952c
THE ASSIMILATION OF SEQUENTIALLY-ENCODED INFORMATION. II. EFFECT OF RATE OF INFORMATION PRESENTATION. — Air Research and Development Command. Human Resources Research Labs., Bolling Air Force Base, D. C. HRRL Memo report no. 25, Sept. 1952. iv+20 p. (AD 140). UNCLASSIFIED

A study was made of the effect upon immediate recall performance of the rate of presentation of the recall materials, the length of the materials, and the number of possible alternatives per unit of the materials. The recall materials were spoken messages with each unit of a given message selected independently from a defined class of possible alternatives. Average proficiency of performance and the variability in performance among subjects were analyzed. Systematic changes were obtained in both the proficiency and the variability measures as a function of the three variables. Effects of rate of message presentation and of the informational content per message unit (number of possible alternatives) were secondary to the effect upon recall performance of message length. The findings were interpreted to indicate a defined informational limit for recall performance which is a function of the encoding procedures employed. The systematic changes in variability were suggested to reflect changes in the range of encoding procedures employed by the experimental subjects. (AD abstract)

Pollack, I. 1952d
THE ASSIMILATION OF SEQUENTIALLY-ENCODED INFORMATION. III. SERIAL POSITION ANALYSIS. — Air Research and Development Command. Human Resources Research Labs., Bolling Air Force Base, D. C. HRRL Memo report no. 25, Sept. 1952. iv+15 p. (AD 1112). PB 117049

An analysis based upon the methodology of information was made of the serial position effects in immediate recall. Greater error was obtained for units near the middle of the recall materials than for units near the end. The basic finding of the study was that recall performance in informational terms is a function of the length of the message and is relatively independent of the informational content. Maximal recovery of information by a detailed serial position analysis was obtained for messages of intermediate length. (AD abstract)

Pollack, I. 1952e
ASSIMILATION OF SEQUENTIALLY-ENCODED INFORMATION. IV. THE INFORMATIONAL CONTRIBUTION OF "WRONG" RESPONSES. — Air Research and Development Command. Human Resources Research Labs., Bolling Air Force Base, D. C. HRRL Memo report no. 25, Sept. 1952. (AD 19 566). PB 113184

The informational contribution of "wrong" responses obtained in immediate recall was investigated with the aid of a multiple-response technique. This technique permitted alternative responses following the initially "wrong" response. The level of performance for the alternative responses following the initially "wrong" responses is significantly better than chance. In fact, the level of performance following two incorrect reproductions, and even the level of performance following three incorrect reproductions, is significantly better than chance. Analysis in terms of measures derived from the theory of information verified the statistical analysis. (Author's summary)

Pollard, J. P. 1952
IN-FLIGHT PROBLEMS IN AIR TRANSPORTATION OF PATIENTS. — Jour. Aviation Med., 23 (1): 15-18. DLC (TL555.A1A4, v. 23)

Discusses problems arising in the air transportation of the sick and wounded. Patients who have gas confined in a body cavity (chest, middle ear, sinuses, stomach, colon) must be transported in pressurized cabins. Hypoxia is usually not a serious problem at low altitudes if oxygen can be breathed by certain patients. Air sickness may be prevented by drugs. In-flight feeding systems are at present unsatisfactory. Litter suspension should be improved. The medical equipment should include all necessary drugs from treatment and sedation of patients and, if necessary, a portable respirator. Training and experience of medical attendants is important.

Pollock, W. T. 1952
and A. Chapanis
THE APPARENT LENGTH OF A LINE AS A FUNCTION OF ITS INCLINATION. — Aug. 21, 1952. i+12 p. Johns Hopkins Univ., Baltimore, Md. (Contract N5ori-166, Task order 1); issued by Office of Naval Research, Naval Research Lab,, Washington, D. C. JHU Report no. 166-I-154 (Project no. NR-784-001) (TIP U24154). UNCLASSIFIED

Vertical and near-vertical lines look longer than horizontal lines of equal length. This illusion has been studied with a total of 80 subjects; with two different lengths of standard comparison lines—3 inches and 6 inches; with the standard comparison line oriented horizontally and vertically; with the standard comparison line above, below, to the right of, and to the left of the variable test line; and with the variable test line tilted at various angles from 0 degrees (horizontal) through 90 degrees (vertical) to 150 degrees. In percentage terms, the data for the two different lengths of lines are virtually identical. Although, on the average, vertical lines consistently look longer than horizontal ones, lines tilted 10 to 30 degrees to the left of vertical look longer than lines at any other angle. At its maximum, the average amount of the illusion is about 10 percent. There are wide individual differences among subjects in the amount of the illusory effect they experience. When the comparison and test lines are one above the other, overestimations are consistently less than when the two lines are side by side. (Author's abstract)

Porot, M. see Malmejac, J., 1952a

Postle, J. A. 1952
PATIENT EVACUATION IN EUROPE. — Med. Bull. European Command, 9 (3): 126-128. 1952. DLC

Emergency evacuation of patients is carried out by the Hospitalization and Evacuation Section of the [U. S. Army] European Command (EUCOM) Medical Division. The patients are flown from various European countries, North Africa, and Lebanon to Germany in C-97 planes capable of accomodating 51 litter patients. Another air evacuation service carries patients from EUCOM hospitals, to the United States in C-97's and Constellations. Over 1,500 patients were evacuated in 1951 to EUCOM hospitals, and 2,000 from EUCOM to the United States.

Powell, C. P. see Gerstner, H. B., 1952

Price, H. G. 1952
ANXIETY AND FAILURE AS FACTORS IN THE PERFORMANCE OF MOTOR TASKS. — Dec. 1952. 21 p. State Univ. of Iowa, Iowa City, (Contract AF 33(038)-13214); issued by Air Training Command, Human Resources Research Center, Lackland Air Force Base, Tex. Research bulletin no. 52-34. (Project no. 509-020-0006; AD 3779). UNCLASSIFIED

Ninety women subjects were chosen on the basis of their extreme scores on the Taylor Anxiety Scale. Half scored in the highest 20% of the distribution (H) and half scored in the lowest 20% (L). Three subgroups of the H and L groups took a preliminary test consisting of 20 trials on the turret pursuit apparatus followed by neutral verbal instructions, verbal failure instructions, and a reversed setting followed by neutral instructions, respectively. The criterion test was 20 trials on the epicyclic pursuit rotor. The hypothesis that H subjects should show performance superior to L subjects on the tests was not borne out. The performance-induced failure in the turret test raised the drive level of the L group toward an optimal level for the performance of the epicyclic task. The effect of verbal failure was not clarified. There was no tendency for either manifest anxiety or failure experience to function differentially with regard to the epicyclic task. (AD abstract)

Prindle, R. A. see Ingalls, T. H., 1952

Prochnik, G., 1952
G. L. Maison, and J. W. Stutzman
CAROTID-OCCLUSION-PRESSOR REFLEX: INFLUENCE OF EXISTING MEAN ARTERIAL PRESSURE, OF ANESTHETICS AND OF GANGLIONIC- AND ADRENERGIC-BLOCKING DRUGS. — In: Bauer, R. O. and others, The effects of drug-induced alterations . . . , p. 4-10. Wright Air Development Command. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-222, June 1952 (RDO no. 696-61) (ATI 171 952). UNCLASSIFIED

This is a reprint of the paper, Prochnik, G., 1950 (Amer. Jour. Physiol., v. 162 (3): 553-559). The mean arterial pressure was recorded in dogs anesthetized with pentobarbital, urethane, or ether. Recordings were taken in another group of dogs after tetraethylammonium chloride (TEA) and adrenergic blocking drugs (such as dihydroergocornine (DHO) or benzyl bis β chloroethyl amine) had been infused in the femoral or jugular vein. Occlusion was then performed on the exposed carotid for 30 seconds. The pressure response was found to be directly proportional to pre-existing mean arterial pressure. This rela-

tionship did not differ in the anesthetized dogs. However, TEA, DHO, and benzyl bis β chloroethyl amine suppressed the pressure response to carotid occlusion and altered the relationship of response to mean arterial pressure. Graphic representations of the relationships of carotid occlusion pressure response to mean arterial pressure under the various experimental conditions are included.

Prochnik, G. see also Bauer, R., 1952

Pryor, W. W., 1952
H. O. Sieker, and R. L. McWhorter
SPATIAL VECTOR ANALYSIS OF THE ELECTROCARDIOGRAM DURING EXPOSURE TO POSITIVE ACCELERATION. — Jour. Aviation Med., 23 (6): 550-559. 1952.
DLC (TL555.A1A4, v. 23)

"1. Standard limb and unipolar lead EKG's have been recorded simultaneously on seven healthy male subjects during positive acceleration [on the human centrifuge]. — 2. The records were analyzed by the method of spatial vector analysis in an effort to separate changes caused by rotation of the heart from alterations caused by a change in the electrical activity of the myocardium. — 3. At levels of acceleration insufficient to cause visual symptoms only one subject demonstrated alterations in the EKG described by earlier investigators. This subject was also the only one showing changes after being tilted to 90 degrees. The relationship between these Tw changes and the autonomic instability observed in this individual have been discussed in the light of Wendo's observations on patients with neurocirculatory asthenia demonstrating such EKG changes during tilt. — 4. Among the remaining subjects only two showed any Tw changes, even when the acceleration was sufficient to cause 'blackout.' In these two instances the alterations in the Tw waves are less marked, but also are most likely secondary to changes in the autonomic tone and filling of the heart. — 5. There was no S-T segment shift to suggest coronary insufficiency in any subject..." (From the authors' summary.)

Pryor, W. W. see also Marks, G., 1952

(Psycho-Acoustic Lab.) 1952
[INVESTIGATION AND STUDIES ON VOICE COMMUNICATION] — Harvard Univ. Psycho-Acoustic Lab., Cambridge, Mass. Report no. PNM-47; Periodic status report no. 19, Nov. 16, 1951 - May 15, 1952. 13 p. (Contract N5ori-76, Task order 2; TIP U22091). UNCLASSIFIED

Completed research on the following is summarized briefly: a statistical description of N_1 click responses recorded at the round window of the cat; electrical responses to pairs of acoustic clicks at the round window and auditory cortex; the effect of frequency and amplitude distortion on the intelligibility of speech in noise; and the loudness of bands of noise. Progress is reported on studies of the effects upon auditory localization of training with a rotated binaural axis; sound produced by rubbing the skin an a.c.-carrying electrode; effect of a tone in one ear upon the threshold of hearing in the other ear; role of bone conduction in cross-hearing and in acoustic insulation at the ear; variability of cortical responses to acoustic clicks; electrical responses to acoustic stimuli in the monkey; methods for determining abnormal pitch perception; pitch anomalies near tonal gaps; and a case of tonal monaural diplacusis. Reports issued by the laboratory are listed with journal references for those published. (TIP abstract)

(Psycho-Acoustic Lab.) 1952a
[INVESTIGATION AND STUDIES ON VOICE COMMUNICATION] — Harvard Univ. Psycho-Acoustic Lab., Cambridge, Mass. Report no. PNM-49; Periodic status report no. 20, May 16-Nov. 15, 1952. 14 p. (Contract N5ori-76, Task order 2; TIP U25367). UNCLASSIFIED

Completed research on the following is summarized briefly: gross localization of the origin of cochlear microphonics, ear protectors, pure-tone tinnitus evoked by acoustic stimulation (the idiophonic effect), and the effect of different types of electrodes in electrophonic hearing. Progress is reported on studies including: noise survey; the effects upon auditory localization of training with a rotated binaural axis; a statistical model for the analysis of the N_1 response to pairs of clicks; sound produced by rubbing the skin with an a.c.-carrying electrode; the effect of a tone in one ear upon the threshold of hearing in the other; the role of bone conduction in cross-hearing and in acoustic insulation at the ear; electrical responses to acoustic stimuli in the monkey; pitch and the octave relation; pitch anomalies near tonal gaps; tonal monaural diplacusis; effects of depth of barbiturate anesthesia on the response of the cat's auditory cortex to pure-tone bursts; the relation between articulation test scores and information transmitted through a communications channel; mode of fluctuation of the auditory threshold; facilitation; spontaneous activity at the auditory cortex; a comparison of various measures of the response to auditory clicks; and nonindependence of successive responses. Reports issued by the laboratory are listed with journal references for those published. (TIP abstract)

Pugh, L. 1952
MODERN ADVANCES AND TRENDS IN MILITARY MEDICINE. — Jour. Amer. Med. Assoc., 148 (12): 1011-1015. March 22, 1952.
DLC (R15.A48, v. 148)

Part of this paper is dedicated to a description of the improvements made in evacuating casualties from the Korean front by helicopter and by transport plane. The percentage of patients returned to the United States by air has increased from 30% in 1945 to about 98% in 1951. Transportation by air of surgical emergency teams to combat areas has proven highly successful.

Putt, D. L. 1952
TRENDS IN AIRCRAFT DEVELOPMENT AND RESEARCH IN THE AIR FORCE. — SAE Jour., 60 (3): 43-44. 1952. DLC (TL1. S5, v. 60)

Physiological and engineering problems arising from the latest developments in high-speed and high-altitude flight are briefly summarized.

Putt, D. L. 1952a
TRENDS IN U.S. AIR FORCE RESEARCH AND DEVELOPMENT. — Tech. Data Digest (U. S., Central Air Documents Office), 17 (1): 7-12. 1952. DLC (Z5063. A2U65, v. 17)

Within the context of a review of the progress made in aviation industry and research, the author summarizes briefly the recent advances in aviation medicine. Research in space medicine is still in the beginning stage, covering such tasks as protection against solar and cosmic radiation, cabin pressurization and air conditioning, and adaptation to sub-g conditions, as well as the exploration of unknown factors, e.g. the possible effects of the magnetic energy developed in cutting through the earth's magnetic field at high speed.

Rahn, H. 1952
and D. Hammond
VITAL CAPACITY AT REDUCED BAROMETRIC PRESSURE. — Jour. Applied Physiol., 4 (9): 715-724. 1952. DLC (QP1.J72, v. 4)

Vital capacity (spirometer) tests were carried out on healthy subjects under various conditions. At simulated altitudes of 10,000, 14,000 and 18,000 ft., when breathing air, the average vital capacity reduction was 0.2, 2.4 and 3.8%, respectively. Following administration of oxygen, however, the vital capacity was restored to 99%. Inhaling of low oxygen-nitrogen mixtures at ground level brought about results similar to those of altitude exposure. Acute exposures to simulated altitudes of 20,000, 30,000 and 40,000 ft. while breathing oxygen resulted in a marked decrease in vital capacity and in the expiratory reserve volume. — During prolonged exposure to an altitude of 14,200 ft. on Mt. Evans, Colorado, the maximum reduction in vital capacity was 4% on the third day of the seven-day stay, and was followed by a recovery exceeding the values of the controls staying in Rochester, New York. When 700 to 800 milliliter fluid was ingested at ground level, the effects of artificial abdominal distention upon vital capacity were not significant. — The strength of the respiratory muscles (when maximum expiration was followed by full inspiration) was reduced considerably when low oxygen mixtures were inhaled at ground level.

Rait, W. L. 1952
POST-DECOMPRESSION SHOCK. — Med. Jour. Australia, 2 (15): 533-534. 1952. DSG (W3 AU677, v. 2)

Altitude flying may lead to collapse either during decompression or after return to the ground. Studies of decompression sickness usually center around the formation of gas bubbles in the blood stream, but little has been done with regard to the mechanism of postdecompression shock. Clinical investigations suggest that in some subjects a trigger mechanism is set off during decompression, starting the development of secondary shock. This shock might be due to either aeroembolism or a biochemical disturbance (e.g., a disorder of nucleotide metabolism, acute adrenal cortical insufficiency, or a histamine upset). A study of these disturbances would necessitate the following tests: determination of the plasma pentose content (any increase would indicate a disturbance of the nucleotide metabolism); estimation of the ascorbic acid content of the adrenal glands and an absolute lymphocyte count; and determination of the histamine and the histaminase contents of the lung after decompression. The author emphasizes the necessity of examination of the pilots before and after flight; primary and delayed reactions should be carefully observed as the prognosis of shock depends upon restoration of the blood pressure.

Rand, G. W. see Niven, J. I., 1952
Randall, W. C. see Peiss, C. N., 1952
Ranken, H. B. see Brown, John L., 1952
Rankin, R. E. see Bahrick, H., 1952

Rawnsley, A. [I.] 1952
and J. D. Harris
STUDIES IN SHORT DURATION AUDITORY FATIGUE. IV. RECOVERY TIME. — Naval Medical Research Lab., New London, Conn. Report no. 187 (vol. 11, no. 4), Jan. 30, 1952. 11 p., 7 plates. (Project report no. NM 003 041.34.03; TIP U22172). UNCLASSIFIED

The relations of auditory fatigue to the interval between stimulations and to the intensity and frequency of stimulation was investigated by exposing subjects to a fatiguing tone lasting 400 msec. and followed, after an interval of 20 to 300 msec., by a test tone lasting 50 msec. The frequencies were 500, 3000, or 8000 c.p.s., and the fatiguing tone was either 10, 30, 50, or 70 db. The shift between the thresholds for the test tone alone and the test tone preceded by the fatiguing tone was taken as the amount of auditory fatigue. Recovery from tones of any frequency up to 70-db. sensation level, acting for 400 msec., was complete within little more than a third of a second. Recovery from weaker stimuli was proportionately quicker; at about the 50-db. sensation level recovery was about exponential; at still weaker levels a negative acceleration was apparent. Location of the fatigue was assumed to be cochlear since the recovery pattern was similar in a patient with a radical ossiculectomy, thus ruling out the middle ear. Results from cross-conduction experiments also precluded involvement of the central nervous system. However, it was not possible to define exactly the locus of the adapting mechanism as within the peripheral organ, or at the transmission between the sense cells and the first nerve fibers, or whether it was purely neural. (TIP abstract)

Rawnsley, A. I. 1952a
and J. D. Harris
STUDIES IN SHORT DURATION AUDITORY FATIGUE. V. AN INVESTIGATION OF THE

SPREAD OF FATIGUE WITHIN NARROW FREQUENCY LIMITS. — Naval Medical Research Lab., New London, Conn. Report no. 199 (vol. 11, no. 16), May 16, 1952. 14 p. (Project report no. NM 003 041.34.04; TIP U25401). UNCLASSIFIED

The ability of the ear to perceive 50-millisecond test tones of varying frequencies, which are presented 35 msec. after presentation of a 1000-c. p. s. tone was measured on 5 observers. The first tone was presented at sensation levels of 30 to 90 db. in 10-db. steps, while the frequencies of the second tone varied from 900 to 1100 c. p. s. The greatest decrement in sensitivity was for 990- to 1010-c. p. s. test tones in the form of a broad spread (+ 10 c. p. s.) at the higher sensation levels, while at lower sensation levels only a slight effect was noted. The peaking of fatigue effects was not related to the pitch-discrimination ability of the observer. The data confirm observations that the peripheral organ presents a relatively coarse frequency pattern which is centrally sharpened and elaborated. The total fatiguing effect over the frequency spectrum of the sonar echo-ranging equipment can be calculated from the data presented. (TIP abstract)

Ray, J. T. see Guedry, F. E., 1952a

Raymond, M. P. 1952
[ACUTE PLEURO-PULMONARY ACCIDENTS FOLLOWING ACCIDENTAL ASPIRATION OF GASOLINE] Accidents pleuro-pulmonaires aigus consécutifs à l'aspiration accidentelle d'essence. — Archives des maladies professionelles de médecine et du travail et de sécurité sociale (Paris), 13 (3): 280-282. 1952. In French. DSG

A case history of gasoline poisoning in given. Initial asphyxia was followed by a pneumopathic condition accompanied by high temperatures and complicated rapidly by aseptic puriform pleurisy. The patient's condition improved, however, progressively after about 10 days, and there remain no aftereffects. A brief discussion of the pathology of the case concludes the paper.

Redmond, R. F., 1952
L. J. Milch, and W. W. Calhoun
EFFECTS OF HYPERSENSITIVITY AND STRESS ON SERUM LIPOPROTEIN. — School of Aviation Medicine, Randolph Field, Tex. July 1952. iii+4 p. (Project no. 21-32-020, Report no. 2; TIP U23214). PB 107186

Lipid, lipoprotein, and protein changes were studied in the blood of 115 rabbits exposed to three types of treatment or subjected to combinations of these treatments. The first group was exposed to a simulated altitude of 16,000 to 22,000 ft. about two hours daily for five days per week. The second group received 2.5 mg. of ACTH by intramuscular injection each day in 2 doses for 5 days per week. The third group was hypersensitized with a single intravenous injection of 10 ml. horse serum per kilogram body weight. After 42 days of treatment the animals were sacrificed. The hypersensitive rabbits demonstrated very significant increases in concentrations of serum cholesterol and α_2-globulin and corresponding decreases in serum α_1-globulin and in the serum albumin-globulin ratio. Hypersensitivity also seemed to be associated with an increase in the serum concentration of γ-globulin. Exposure to altitude increased concentration of α_1-globulin and decreased the serum albumin-globulin ratio. Altitude and ACTH had very little influence on modifying the effects of hypersensitivity on the serum patterns. The combined interaction of all three treatments elevated the serum concentration of the S_f12-20 class of lipoproteins [i. e., with a flotation rate between 12 and 20 Svedberg units, see Science, 111 (2877): 166-171. Feb. 17, 1950].

Redmond, R. F. see also Chinn, H. I., 1952f; Milch, L. J., 1952, 1952a

Reeves, E. see Jones, Horace L., 1952

Regener, V. H. 1952
ATMOSPHERIC OZONE. — In: Physics and medicine of the upper atmosphere: a study of the aeropause, p. 109-122. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico Press, 1952. DLC (RC1050.U5, 1952)

The altitude, density, thickness, and physical characteristics of the ozone layer in the Earth's atmosphere are briefly described. Toxic effects may be expected in the vicinity of 80,000 ft. above sea level. However, the design of protective equipment (filters containing ozone-destroying materials) should be relatively simple. The destructive action of ozone on rubber deserves special attention.

Reid, L. S. see Long, E. R., 1952, 1952a

Reissmann, K. R., 1952
W. L. Burkhardt, and B. Hoelscher
BLOOD DESTRUCTION IN THE POLYCYTHEMIA INDUCED BY HYPOXIA. — Blood, 7 (3): 337-349. 1952. DSG

Hemoglobin catabolism before, during, and after exposure to a simulated altitude of 20,000 feet was studied in bile-fistula dogs with reference to developing and diminishing polycythemia. The life span of red cells was found to be the same in altitude-exposed animals as in controls kept at ground level, i.e., 115 days. Polycythemic blood levels returned back to normal within about 6-8 weeks after return to ground level, as a result of depressed erythropoiesis combined with increased red blood cell destruction. The increase in red blood cells during altitude exposure was accompanied by a marked increase in bile pigment output.

Reissmann, K. R. see also Hoelscher, B., 1952

Reynolds, B. 1952
and I. M. Bilodeau
ACQUISITION AND RETENTION OF THREE PSYCHOMOTOR TESTS AS A FUNCTION OF DISTRIBUTION OF PRACTICE DURING ACQUISITION. — Jour. Exper. Psychol., 44 (1): 19-26. 1952. DLC (BF1.J6, v. 44)

Reprint issued also as: Air Training command. Human Resources Research Center. Perceptual and Motor Skills Research Lab., Lackland Air Force Base, Tex. Research bulletin no. 52-27, Nov. 1952 (TIP U26030).

Between-group differences during acquisition and retention produced by variation in distribution of practice during acquisition were studied in basic trainee airmen. They were assigned randomly to three separate tests: the Rudder Control Test, the Complex Coordination Test, and the Rotary Pursuit Test. Between-group differences were apparent early in training and accompanied the manipulation of the distribution variable. Performance seemed to decline as a function of the intertrial interval. Following the initial trial, the trial-to-trial differences tended to become constant. If the test trial was extended a few minutes beyond the initial training period, the differences between groups were considerably reduced, and with continued practice they tended to disappear.

Reynolds, B. 1952a
THE EFFECT OF LEARNING ON THE PREDICTABILITY OF PSYCHOMOTOR PERFORMANCE. — Jour. Exper. Psychol., 44 (3): 189-198. 1952. DLC (BF1.J6, v. 44)
Reprint issued also as: Air Training Command. Human Resources Research Center. Perceptual and Motor Skills Research Lab., Lackland Air Force Base, Tex. Research bulletin 52-32, Nov. 1952 (AD 3219).

This study was designed to ascertain whether the correlation of the Complex Coordination Test (a psychomotor test) and printed tests used in the Airmen Classification Test Battery decreases as a function of the amount of practice of the psychomotor test. Tests were carried out on 156 basic trainee airmen using six one-hour practice periods on the Complex Coordination Test, with 15 minutes rest between the hour periods except between the third and fourth when one hour's rest was granted. — When the scores of any two practice periods were compared, it was found that (1) correlation decreased according to the amount of practice between the periods, and (2) it increased as a function of the amount of practice preceding the first period. A sufficiently long rest period resulted in a decrement of performance. The correlation of the Complex Coordination Test with the printed tests decreased as a function of training on the psychomotor test.

Reynolds, B. see also Grice, G. R., 1952

Reynolds, J. B. 1952
and I. M. Bilodeau
AN EVALUATION OF SOME MANIPULATION TESTS FOR A BASIC SCALE OF MOTOR ABILITIES. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. P&MS 52-5, March 1952. 6 p. (Project no. 509-020-0005; AD 12 169). UNCLASSIFIED

Eight of 10 manipulation tests administered to 286 basic airmen were found to form a general cluster with respect to intercorrelation and correlation with the Airman Classification Battery AC-1B. The eight tests were two Santa Ana pegboard adaptations, ball-and-pipe, nut stacking, nut-and-bolt manipulation, and three-pin-punch tests. Two finger control tests did not show significant relation to the other tests; no manipulation of small objects were involved as in the other tests. The 8 clustering tests were considered possible items in a basic scale of motor abilities. Single trials scores might serve as items in a manual test, because no marked change existed in the correlation pattern for the first trial scores and the total score. (AD abstract)

Richey, E. O. see Gerstner, H. B., 1952

Richey, H. W. 1952
and J. R. Berkshire
JOB SATISFACTION OF AIR FORCE TECHNICAL SCHOOL INSTRUCTORS. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. TECH 52-12, Dec. 1952. 33 p. (Project no. 507-010-0001; AD 7954). UNCLASSIFIED

The factors important in determining the morale of AF technical school instructors were studied by a questionnaire concerning satisfaction with assignment, administrative policy, supervision, promotion, training, selection of instructors and students, and off-the-job factors, including housing. The responses of 4586 men were obtained from January to June 1950, at several Air Force bases. Civilian employees were better satisfied with their work than airman personnel, and supervisors were better satisfied than instructors. An urgent need was indicated for improvement of conditions affecting personnel morale; however, many conditions result from rapid Air Force expansion. (AD abstract)

Ringenbach, G. 1952
[EFFECT OF FLYING IN A LIGHT PLANE ON THE VAGO-SYMPATHETIC SYSTEM]. Action de l'aviation légère sur le système vago-sympathique. — Journal de médecine de Bordeaux et du Sud-Ouest (Bordeaux), 129: 247-248. 1952. In French. DSG

With the purpose of investigating the mechanism of air sickness, the author undertook a number of flights in a light airplane accompanied by various test subjects. After a rapid ascent to an altitude of 1,000 meters (within 4-5 minutes), he performed a number of flight maneuvers and returned to the ground after 30 minutes. After landing, he immediately examined the test subjects and observed in most instances a distinct hypertonia of the parasympathetic system (expressed in a retarded oculocardiac reflex). In some cases, however, a contrary effect was observed, i. e., an accelerated reflex. Thus, vagotonic subjects had become sympatheticotonic during the plane flight. Since the majority of motion sickness preventives contain drugs which exert a depressing action on the vagus functions (e.g., atropine and scopolamine) and others stimulating the sympa-

thetic system (e.g., ephedrine and benzedrine), it is obvious that such preventives will increase rather than reduce motion sickness symptoms in this particular group of individuals. It is, therefore, recommended that motion sickness remedies be prescribed according to individual physiological conditions and needs.

Roberts, E. E. see Broussard, I. G., 1952

Rodewald, F. A. 1952
and F. F. Fintak
DEVELOPMENT OF SURVIVAL EQUIPMENT PECULIAR TO AIR EVACUATION. — School of Aviation Medicine, Randolph Field, Tex. Apr. 1952. 29 p. (Project no. 21-39-001, Report no. 2; TIP U21509). UNCLASSIFIED

To improve chances for survival in case of crash or ditching of air evacuation aircraft, the following are recommended: (1) Presence of medical personnel to administer aid to crew and patients. (2) Standing operating procedures for crash and ditching of various types of aircraft carrying different types of equipment. (3) Placing the patient in the plane so that he will be protected from additional injury in case of accident. (4) Selection of equipment, clothing, and food to meet the needs if forced down at any point on flights extending over wide ranges of latitude and various types of terrain. (5) Use of lighter equipment and new survival items. (USAF School of Aviation Medicine abstract)

Rohles, F. H. see Payne, R. B., 1952
Romberg, H. W. see Gross, F., 1952, 1952a

Rose, H. W. 1952
MONOCULAR DEPTH PERCEPTION IN FLYING — Jour. Aviation Med., 23 (3): 242-245. 1952. DLC (TL555.A1A4, v. 23)

Visual depth perception is a complex process, involving several functions of the brain. On the surface of the earth, the various phases of depth perception are integrated in the overall picture perceived. In flying, distances can be wrongly assessed in spite of the correct localization of the components of the image.

All pertinent tests at present in use depend on the binocular parallax or the difference of the image in both eyes. This approach is not justified in evaluation tests because pilots afflicted with amblyopia, loss of one eye, etc., have proved to have a good flying ability. The leading factors for depth perception should therefore be expected in the group of monocular clues. The author tested pilot cadets with a motion parallax tester. When the correlation between flying and landing ability was examined, it turned out to be moderate but significant statistically. Thus it may be assumed that the ability to use the motion parallax clue for spatial orientation is one of the factors that enables a pilot to perform a proper landing. The size of the retinal image is the other decisive factor. This is most important in formation flying and when another plane approaches; in this case the retinal and the memory images are compared in the pilots mind.

It is suggested that the motion parallax and the retinal image tests be emphasized in depth perception tests for pilots. The binocular parallax (now included in pilot selection tests) is still useful as an additional proof of binocular vision.

Rose, H. W. 1952a
A BRIGHT-ADAPTATION DEVICE FOR USE WITH DIFFERENT NIGHT-VISION TESTERS. — School of Aviation Medicine, Randolph Field, Tex. April 1952. iii+5 p. (Project no. 21-31-003, Report no. 1; TIP U22461). PB 106892

A hollow metal sphere, 25 cm. in diameter, was coated on the inside with white MgO paint and fitted with a 60-watt bulb in a sliding tube so that internal luminance could be adjusted. An opening, surrounded by a molded frame shaped to fit the eyes and lined with sponge rubber, was located near the top of the device to allow a subject to view comfortably the inside of the sphere. A photoelectric cell extended into the sphere, with its meter on the outside, and permitted a constant estimate of internal brightness. Visual threshold measurements were made on 19 subjects. Following 30 min. of dark adaptation, the subjects were bright-adapted at 30, 95, 300, 950, or 3000 asb. (1 apostilb = 100 microlamberts) for 10 min. with the new adapter. Thresholds were then determined after 2 and 5 min., and every 5 min. thereafter for 45 min. The difference in adaptation was statistically significant after 2, 5, and 10 min. For very low luminance levels, the adaptation influence lasted longer. The device is recommended for use in the Air Force, especially for testing large groups. (TIP abstract)

Rose, H. W. 1952b
and H. [G.] Fleck
NIGHT VISION TRAINER AND TRAINING TECHNIQUES. I. A PROJECTOR FOR BASIC NIGHT VISION TRAINING OF PILOTS. — School of Aviation Medicine, Randolph Field, Tex. June 1952. iii+8 p. (Project no. 21-31-010, Report no. 1; TIP U23251). UNCLASSIFIED

The device provides a wide-angle projection of stationary black-and-white and color pictures and a movable picture of an aircraft in flight. A set of filters on a disk placed in the lens path in the projector can be rotated so that the filter of choice is in the line of light. Maximum luminance either without a filter or with Filter 1 is in the range of the transition zone of cone and rod vision in which color is still visible; Filters 2, 3, and 4 bring the luminance down to pure rod vision. Movement of a slide to which pulleys are attached achieves horizontal movement of an aircraft silhouette superimposed on the background projected from the stationary slide. The silhouette is painted on a glass disk which can be rotated so that the plane appears to cross the background once every 90 sec. from either side of the field. The following can be demonstrated with the projector: dark adaptation, off-center vision, decline and loss of color vision, Purkinje's phenomenon, decline of visual acuity, increase of contrast threshold, usefulness of scanning methods, effect of short-time glare and subsequent recovery, local adaptation, and the autokinetic illusion and its prevention. (TIP abstract)

Rosenblith, W. A., 1952
D. E. Wheeler, and H.[A.] Smedal
PROBLEMS OF HIGH-INTENSITY NOISE. A SURVEY AND RECOMMENDATIONS. — Harvard Univ. Psycho-Acoustic Lab., Cambridge, Mass. Report no. PNR-133, Dec. 30, 1952. ii+25 p. (Contract N5ori-76, Task order 2; AD 6629). PB 109090

The results of the investigation indicate that during the next 3 to 5 years some military tasks will have to be performed in noise levels above 140 db. and probably as high as 160 db. The wearing of ear protectors should be made compulsory for service personnel exposed to these noise levels. Measurements of auditory acuity of Navy flight deck personnel (regularly subjected to noise intensities of 130 db.) showed that most of these persons suffered from severe losses in the range above 1000 c.p.s. The level of noise associated with flying jet planes with afterburners from the decks of carriers has resulted in numerous cases of damaging effects other than auditory. Special selection procedures for flight deck crews should be considered, as personnel seem to vary in their ability to withstand noise and the associated stresses. A tabulation of the data gathered by the survey team is presented. (AD abstract)

Ross, B. P. see Grierson-Jackson, W., 1952

Rothwell, S. 1952
EJECTION SEAT. — U. S. Air Force Medical Service Digest, 3 (9): 19-21. 1952.
DSG (W2 A403u, v. 3)

The advantages and disadvantages of ejection seats are examined. In spite of the fact that safe bailout is generally considered to be depending on proper body position, pilots have escaped injuries being ejected in positions deviating from that prescribed. Comfort features, such as foam-rubber seat cushions, have recently been incorporated in the ejection seat. A mechanical canopy remover was found preferable to the electric mechanism previously used, as it is not incapacitated by power failure. An automatic parachute deployment device, now under development, will provide protection in cases of low-altitude bailout. The M-3 catapult ejector, designed to clear the high tail of bombers, and the M-4 catapult ejector which applies downward ejection, are described. Problems concerning ejection from high-speed aircraft, explosive decompression, and thermal protection are outlined. The capsule-type ejectors offer the greatest potentialities.

Rubinstein, D. see Berry, L. J., 1952; Gerathewohl, S. J., 1952c

Ruchelli, P. B. see Tucci, E. A., 1952

Rudat, W. 1952
[MOTION SICKNESS: ETIOLOGY AND THERAPY] Die Bewegungskrankheiten: Aetiologie und Therapie. — Deutsches medizinisches Journal (Berlin), 3 (15-16): 345-346. 1952.
DSG (W1 BE881, v. 3)

Motion sickness results from inadequate adaptation of medullar, cerebral, and spinal centers to continuous nonphysiological stimuli. Not motion as such, but the rhythmical repetition of exterior stimuli disturbs the adaptive mechanism. Vestibular, proprioceptive, and visual senses take part in the development of the symptoms. The receptors of the inner ear constitute a major etiological factor. A well-functioning labyrinth has been called a prerequisite to motion sickness. The vagus is the effective nerve, and vagotonics are particularly prone to motion sickness. Circulatory disturbance, cerebral anemia, optokinetic nystagmus, shifting tensions and stresses in the abdomen, and neurosis are additional etiological factors. The effectiveness of the German drug "Vomex A" (beta-dimethylaminoethyl benzhydryl ether-1,3-dimethyl-8-chloro-xanthine) is discussed and statistically documented.

Rulon, P. J. see Tiedeman, D. V., 1952

Rupe, J. C. 1952
RESEARCH INTO BASIC METHODS AND TECHNIQUES OF AIR FORCE JOB ANALYSIS. I. — Air Training Command. Human Resources Research Center. Technical Training Research Laboratory, Chanute Air Force Base, Ill. Technical report no. 52-16, Dec. 1952. vii+68 p. (Project no. 507-015-0002; AD 7468)
UNCLASSIFIED

The following five job-analysis methods were evaluated: (1) the questionnaire; (2) the group interview; (3) the individual interview; (4) observation; and (5) the technical conference. — The "Work Performed" section of the questionnaire received lower scores than those obtained by other methods; the relative effectiveness of the other methods in this respect was almost the same. — In reporting tools, materials and equipment, the questionnaire results did not differ significantly from those of the other methods. — Of the methods (2) to (5), the group interview (2) was the less effective in reporting work activities while the relative effectiveness of the other three methods (3 to 5) was essentially the same. — The questionnaire survey is the least expensive in terms of man hours; the cost of the individual interview represents an average, and this method provides as much information as, or more than, the more expensive technical conference and observation methods.

Rush, C. H. see Hemphill, J. K., 1952a

Rusk, H. A. 1952
NEW PLANES POINT UP NEED TO STUDY "HUMAN ELEMENT". — New York Times, May 25, 1952, p. 49 (col. 1-3). 1952.
DLC

Two-thirds of the nation's military airplane accidents have been linked to the human element (a term preferable to that of "pilot error"). Control of the human element in flying is the most important responsibility of the flight surgeon. In this he finds himself engaged in a never-ending race against the technical advances of airplane production and design with the resulting higher demands on the human capacities. Under the cir-

cumstances, a raising of physical, mental, and emotional standards of civilian and military pilots appears mandatory in the interest of public safety.

Rusk, H. A. 1952a
"JET AGE" EMPHASIZES NEED FOR AEROMEDICAL RESEARCH. — New York Times, June 1, 1952, p. 63 (col. 4-6). 1952.
DLC

The Health Resources Advisory Committee of the U. S. Office of Defense Mobilization, headed by Lieut. Gen. James A. Doolittle, has engaged in a survey which resulted in the following basic suggestions: (1) to study methods of increasing and implementing research into the physiological and psychological factors of flying; (2) to re-examine physical standards for flying now used by the Civil Aeronautics Administration (CAA); and (3) to study the administrative structure for medical services within the CAA and the airline companies. — There is an increasingly urgent need for basic research on the physiological and psychological changes due due to aging.

Ryan, J. J. see Baldes, E. J., 1952

Saathoff, H. see Opitz, E., 1952a

Sachs, L. D. 1952
HISTORICAL SKETCHES OF THE CATAPULT DEVELOPMENT PROGRAM. — Frankford Arsenal. Pitman-Dunn Labs., Philadelphia, Pa. [1952] 11 p. (AD 14 357). UNCLASSIFIED

"Since 1945 when the catapult program was first undertaken at Frankford Arsenal, ten catapult devices have been standardized which include four aircraft personnel catapults for upward ejection, the M1, M2, M3 and M5, one personnel catapult for downward ejection, the M4 catapult, three aircraft canopy removers, the M1, M2, and M3, one initiator, M3, and one exactor, M1. Currently under development are four catapults, the T10 and T15 personnel catapults for upward ejection, the T13, the radio beacon catapult, and the T14, the indoctrination catapult, four thrustors, T1, T2, and T4, a cartridge actuated system for emergency release of harness, the T8, a large power supply to operate a device by gas pressure through 50 feet of flexibile hose, the T5 initiators, a gas operated initiator similar to the T4 initiator for use as a booster, and a delay type of initiator for lap belt release after catapult ejection. Other catapultic type devices under development include a bomb and stores ejector which is an 8" stroke catapult which imparts an acceleration of 10 g to a 1200 pound mass; associated equipment under development for use with the T13 beacon catapult includes a parachute ejector, a parachute release device, and a cartridge actuated power generator" (p.11).

Sailer, E. see Verzar, F., 1952a

Sala, O. 1952
and G. Pivotti
[INVESTIGATIONS ON THE RELATIONS BETWEEN ACCELERATION STIMULI OF HIGH INTENSITY AND VESTIBULAR RESPONSE]. Richerche sui rapporti tra stimoli acceleratori di alto valore fisico e risposta vestibolare. — Bollettino della società italiana di biologia sperimentale (Napoli), 28 (11): 1750-1753. 1952. In Italian. DA (44a.8, So12, v. 28)

The correlation of the amount and duration of angular acceleration with postrotatory nystagmus was established experimentally on 15 rabbits at angular accelerations higher than 666°/sec^2. In that range, increases of angular deceleration were not followed by a proportional increase in the duration of nystagmus and in the number of eye movements (as was the case at lower accelerations).

Sammartino, R. see Chiodi, H., 1952
Samuel, G. D. see Morant, G. M., 1952

Santos, F. R. dos 1952
[PARACHUTE JUMPING: DECISION AND PROBLEMS]. Salto paraquedas, decisão e problemas. — Imprensa médica (Rio de Janeiro), 28 (459): 51-67. 1952. In Portuguese. DSG

The decision to bail out from an airplane is influenced by factors related to the aircraft (type, condition, position in the air, velocity, and degree of maneuverability), by factors related to the altitude (degree of anoxia, temperature, and distance from antiaircraft fire in combat), by terrain features, and by atmospheric conditions. Factors determining the degree of safety during the jump are as follows: acceleration during free fall, deceleration during opening of the parachute, and impact on hitting the ground.

An analysis of 50 fatal instances (17.5%) out of 400 emergency bailouts revealed the following causes: (1) bailout elevation was too low, 48%; (2) the parachute got caught in the plane, 10%; (3) the subject was hit by the plane during fall, 20%; and (4) other causes (parachute was improperly adjusted prior to jump, parachute caught fire from burning plane, drowning of airman), 22%. Bone fractures on hitting the ground occurred three times less in experienced parachute jumpers than in those who had never jumped. In conclusion, the most important reasons for the unsuccessful outcome of emergency bailouts are summarized.

Savely, H. E. 1952
HUMAN PROBLEMS IN ESCAPE FROM HIGH-SPEED AIRCRAFT. — Air Univ. Quart. Rev., 5 (2): 65-67. 1952. DN-Aer

(1) The use of high-pressure masks, breathing helmets, and elastic vests has proven disadvantageous (painful distension of unprotected facial areas, pooling of blood in the limbs, leakages through the mask). — (2) Determinations of human acceleration tolerance by means of catapult devices revealed that an average of 20 g's

for 1/10 second, or 25 g's for .01 second is withstood without injury. The rate of application of the ejecting force has an influence on the interaction between man and seat; slower application of force will make higher ejection velocities tolerable. — (3) Measurements carried out on the linear decelerator (deceleration cart) have shown that man can tolerate up to 45 g's wearing a simple crash harness. The rate of application of the decelerating force determines again the effect on the human organism (shock signs were observed at deceleration rates of 1360 g/sec., while a rate of 493 g/sec. caused no ill effects at decelerations up to 40 g). Experimental investigations of decelerations of longer duration with the body rotating in one or more planes are still outstanding. — (4) Wind-blast effects were measured under simulated conditions in wind-tunnel tests on unprotected humans at wind speeds up to 425 m. p. h. (normal bailouts) and up to 470 m. p. h. (test seat ejections). Blasts at sonic speeds were directed at dummies wearing an A-13A oxygen mask and U. S. Air Force P-3 helmets. Tissues of the body protected from the direct force showed no ill effects. Medium-weight winter flying clothing affords ample protection against high-altitude temperatures (up to 80,000 ft.)

Schaefer, H. J. 1952
EXPOSURE HAZARD FROM COSMIC RADIATION AT EXTREME ALTITUDE AND IN FREE SPACE. — Jour. Amer. Rocket Soc., 22 (5): 277-283. 1952. DLC (TL780. A613, v. 22)

The deflecting influence of the geomagnetic and heliomagnetic fields on primary cosmic radiation (decreasing in intensity from the equator to the poles) has so far precluded direct measurements of the effects of cosmic radiation on living organisms. In the lower regions of the earth's atmosphere, all primary rays are extinguished by collisions. The formation of secondary particles takes place under immense dissipation of energy, the rate of which decreases after reaching a maximum at 70,000 ft. The fact that the primaries transfer their energy mainly to mesons, alpha particles, neutrons, protons, and electrons has great importance with regard to the biological effectiveness of the cosmic ray energy. Since above 70,000 ft. the heavy components (alpha particles which possess a very high biological effectiveness) participate in the production of the total ionization dosage, one may expect in this region a considerably higher exposure hazard than in the corresponding regions below 70,000 ft. It may assumed with some degree of certainty that outside the protective shield of geomagnetic deflection, radiation hazards will be extremely high. Too little is known about the influence of the heliomagnetic field to allow any deductions as to its possible protective action against primary cosmic radiation.

Schaefer, H. J. 1952a
THE BIOLOGIC EFFECTS OF COSMIC RADIATION. — In: Physics and medicine of the upper atmosphere: a study of the aeropause, p. 290-315. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico, 1952.
DLC (RC1050. U5, 1952)

Radiation effects on living organisms may be divided into two groups: (1) effects on the gene structure of the germ cells and (2) effects on the somatic cells. Ionizing radiation might produce in the chromosomes changes which manifest themselves when the cell undergoes mitotic division. The paper discusses in detail the mechanism of chromosome breaks caused by traversing ionizing particles. By means of diagrams and photomicrographs it is shown how the probability of the production of multiple breaks is greatly increased in the case of heavy nuclei as encountered in primary radiation at about 90,000 ft. altitude. Due to the uneveness of ionization events from primary cosmic radiation in living tissues it is difficult to predict the nature and severity of radiation hazards in exact quantitative terms. While radiation from heavy nuclei can be reproduced in the laboratory, the phenomenon of "disintegration stars" (which occur when a primary particle of high energy undergoes a nuclear collision with a target atom of higher atomic weight) is an exclusive characteristic of primary cosmic rays. Fluctuations in ionization intensity resulting in the incidence of abnormally large numbers of secondary cosmic ray particles (the so called "air showers") are another characteristic of cosmic radiation. Studies on the physiological effects of these showers are reviewed.

Schaefer, H. J. 1952b
EXPOSURE HAZARDS FROM COSMIC RADIATION BEYOND THE STRATOSPHERE AND IN FREE SPACE. — Naval School of Aviation Medicine, Pensacola, Fla. March 31, 1952. 9+7 p. (Project report no. NM 001 059. 13. 03; TIP U22326). UNCLASSIFIED

The ionization dosage from cosmic radiation increases from its sea level value of 0.1 milliroentgen-equivalent-physical per 24 hours to a maximum of 15 mrep/d at 75,000 feet in northern latitudes. It then decreases and levels off to a value of 9 mrep/d which is reached at about 140,000 feet. At larger distances from the earth the ionization dosage can be expected to increase again to twice the last mentioned value due to the gradually vanishing shadow effect of the earth.

The actual ionization dosages in larger absorber masses (airplanes, rocket ships) will be considerably higher due to the transition effect.

The main contribution to a possible exposure hazard in the outer regions comes from the heavy nuclei component due to the extremely high specific ionizations of these particles. It is especially the so-called thin-down part and the preceding ionization peak of the low-energy particles which have to be considered most harmful. A unique characteristic of the heavy nuclei is the large radial spread of the ionization. A human organism exposed to the full heavy nuclei intensity will receive about 100 such hits per hour. No appraisal of the biological significance of this

entirely new type of radiation exposure can be given at present.

The deflecting influence of the geomagnetic field excludes low-energy primaries from the equatorial belt. The thin-down phenomenon is limited to northern latitudes. (From the author's summary)

Schaefer, H. J. 1952c
THE RADIAL SPREAD OF THE TISSUE IONIZATION DOSAGE IN HEAVY NUCLEI TRACKS TRACKS OF THE PRIMARY COSMIC RADIATION. — Naval School of Aviation Medicine, Pensacola, Fla. Aug. 5, 1952. 19+9 p. (Project report no. NM 001 059.13.04; TIP U24414). UNCLASSIFIED

The radial distribution of the ionization for heavy nuclei tracks in living tissue is derived by an approximate graphical method and compared to the distribution of normal α-rays from natural radioactive substances. No simple relationship is found between the specific ionization of an ionizing radiation and the quantity of the resulting biological effect. The changes in radial distribution with gradual loss in energy of the nucleus are computed for the maximum transferable energy, angular energy distribution, and δ-ray production. The difficulties in converting from physical qualities to the radial spread of radiobiological effect are discussed. (TIP abstract)

Schaefer, K. E., 1952
E. R. Cornish, C. A. Lukas, and C. R. Carey
RESPIRATION AND CIRCULATION DURING AND AFTER INHALATION OF VARIOUS CONCENTRATIONS OF CARBON DIOXIDE. — Naval Medical Research Lab., New London, Conn. Report no. 189 (vol. 11, no. 6), March 6, 1952. 18+2 p. (Project report no. NM 002 015.03.06; TIP U22534). UNCLASSIFIED

Continuous recordings of alveolar gas tensions were made for 38 healthy male subjects between the ages of 19 and 39 during and after 15-minute exposures to 3.3, 5.4, and 7.5% CO_2. The respiratory and pulse rates increased significantly at 7.5% CO_2. In most cases, alveolar CO_2 and O_2 tensions during inhalation of 7.5% CO_2 reached a plateau within 10 minutes. After transition to air, following the CO_2 exposure, the alveolar CO_2 tension in 8 subjects dropped to below the initial level; this hypocapnia effect, considered an aftereffect of central excitation, was greater after 5% than after 3 or 7% CO_2. The 7% CO_2 apparently had a narcotic action commensurate with its direct stimulatory effect on the respiratory center. Training-tank instructors had a significantly lower respiratory response to CO_2 and low O_2 than laboratory personnel; the differences in response may be based on a different sensitivity of the chemoreceptors. (TIP abstract)

Schaefer, K. E., 1952a
E. R. Cornish, S. E. Stuntz, C. A. Lukas, H. E. Brewer, and C. R. Carey
EFFECT OF INHALATION OF VARIOUS CARBON DIOXIDE CONCENTRATIONS ON THE INHIBITORY EFFECT OF LIGHT STIMULI ON ALPHA WAVES AND MUSCLE POTENTIAL OUTPUT OF THE FOREHEAD. — Naval Medical Research Lab., New London, Conn. Report no. 192 (vol. 11, no. 9), March 17, 1952. 21+5 p. (Project report no. NM 002 015.03.07; TIP 22578). UNCLASSIFIED

Twenty-six healthy males, aged 19 to 39 years, were exposed to 3.3, 5.4, and approximately 7.5% CO_2 mixtures. The subjects breathed air and CO_2 alternately, each for 15 minutes. The inhibitory effect of light stimuli on α waves decreased significantly in proportion to the increasing concentrations. A state of central fatigue existed under 7.5% CO_2 which corresponded to that reported after 3 days' exposure to 3% CO_2 (cf. Pflügers Archiv für die gesamte Physiologie 251:726-40, 1949), indicating a time-concentration relationship. The muscle potential output of the supraorbital muscles increased during inhalation of 5.4 and 7.5% CO_2 (significantly during 5.4%), indicating a higher muscle tone under CO_2 which corresponded with signs of sympathetic stimulation (elevation of blood sugar and heart rate, drop in eosinophils, symptoms of overactivity of the limbs). Voluntary muscle contraction (eye opening) followed by light stimuli produced an elevated muscle potential output above the tonus level which significantly decreased with increasing alveolar CO_2 concentration. Basic muscle potential output (muscle tone) did not give an indication of alertness under CO_2. (TIP abstract)

Schaefer, W. C. <u>see</u> Hill, J. H., 1952a

Schafer, G. E. 1952
and R. T. Gallagher
ILLUSIONS. — Flying Safety, 8 (7): 18-22. 1952. DNACA

The basic facts concerning orientation in space, vestibular functions, and proprioception are outlined in popular terms. Among the visual illusions the following are discussed: the autokinetic phenomenon (sensation of apparent movement of a light fixed against a uniform background); relative motion (such as experienced when passing a stationary train in a train close by), false horizons (cloud banks), and size-space relation illusions. Among the illusions due to vestibular disturbances, the following are noteworthy: the sensation of leaning in the direction of a roll (after the plane rolls suddenly in the opposite direction); sensation of leaning in the opposite direction (under identical conditions, after the plane slowly leans into the opposite direction); the oculogyral illusion ("graveyard spin"); and the sensation of rotating about all three axes during horizontal flight. The introduction of the artificial horizon has added a highly important safety factor.

Schapiro, H. B. 1952
FACTORS AFFECTING LEGIBILITY OF DIGITS. — June 1952. 4+17 p. Univ. of Rochester. Department of Psychology, N. Y. (Contract AF 33(038)-18317); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-127 (RDO 694-41) (AD 1117). PB 108486

Tests were conducted to determine the effects

of the interactions of illumination level (0.11, 0.044, 0.145, and 0.975 foot-lambert) and stroke width to over-all height ratios (1:5, 1:6.25, 1:8, and 1:10) on the legibility of single digits. The digit styles were AND 10400 (Air Force-Navy Aeronautical Design), Berger, Craik, and Mackworth. The legibility was determined by measuring the speed of response with a timer controlled by the light source and the microphone used to record the response. Twelve subjects, each with good vision, read 3200 digits in the factorially designed experiment. Analysis of the timing and magnetic-tape-recorded data showed that the level of illumination is the most important factor in legibility; there was a marked improvement in in performance from 0.011 to 0.044 foot-lambert, but relatively little additional change for higher brightness levels. The Mackworth digits were the most legible with the AND 10400 style following. Ratios of 1:5 and 1:6.25 were superior to others tested. The differences between subjects were more important than any other source of variability except illumination. (AD abstract)

Schiller, A. A. 1952
and G. N. Wool
DISAPPEARANCE RATE OF FLUORESCEIN CONJUGATED PLASMA PROTEINS FROM THE CIRCULATION OF HYPOXIC RATS. — Federation Proceedings, 11 (1 I): 139. 1952. DSG

Fluorescein-conjugated homologous plasma proteins were injected intravenously into rats and separate groups of these animals were exposed for 3 hours to simulated altitudes of 18,000, 28,000, 30,000, and 34,000 feet, respectively. Blood samples (from tail veins) taken prior to and following altitude exposure were examined fluoro-photometrically for concentrations of the fluorescein label. The disappearance rate in the altitude-exposed animals was 3.9 ± 0.8 hours, as compared to 4.0 ± 0.9 hours in the ground controls (there was little difference among the various experimental groups). It is concluded that anoxia (up to pO_2 25 mm. Hg and oxygen-hemoglobin saturation 30%) does not produce hemodynamic or permeability changes which would alter transcapillary passage of plasma proteins.

Schmidt, C. F. see Aviado, D. M., 1952, 1952a

Schmidt, Ingeborg 1952
NEW TESTS FOR THE EXAMINATION AND TRAINING OF COLOR VISION. III. COLOR VISION MULTITESTER (SIGNAL LAMP) FOR AVIATION. — School of Aviation Medicine, Randolph Field, Tex. April 1952. iii+14 p. (Project no. 21-29-006, Report no. 3; TIP U22758). PB 107068

The Multitester, patterned after that of Ingeborg Schmidt (cf. Der deutsche Militärarzt, 6:539, 1941), is a portable instrument capable of testing the color vision of 5 subjects simultaneously. The principle of operation is that of presenting standardized colored lights which simulate airfield signals. The device is a 12-sided, double-walled drum which rotates automatically about a light housing. A 75-w. bulb is located in the side center of the inner housing, and two 25-w. bulbs are at the top and bottom. Each of the 12 sides contains 3 openings which have red, green, and amber filters of a quality calculated to equal landing signals in size, brightness, color saturation, composition, and background when the signals are seen from an airplane at distances of 1 and 1.5 miles without atmospheric obstruction. Eleven of the sides have the signals 6.5 cm. from each other; the twelfth side is provided with three 2-cm.-diameter tubes coupled with an illuminometer for the purpose of controlling signal brightness. During the test, the subjects are seated around the Multitester in a 10-foot radius and report the colors of the 3 lights they see separately per drum side. Each exposure lasts 10 seconds; there is a 5-second rest interval while the drum rotates to the next position. The tester is expected to supply simple pass-or-fail differentiation. (TIP abstract, modified)

Schmidt, Ingeborg 1952a
COMPARATIVE EVALUATION OF THE HARDY-RAND-RITTLER POLYCHROMATIC PLATES FOR TESTING COLOR VISION. — School of Aviation Medicine, Randolph Field, Tex. June 1952. iii+10 p. (Project no. 21-31-013; TIP U23638). PB 107069

The Hardy-Rand-Rittler (H-R-R) polychromatic plates are comparable to the American Optical Company 19-plate test in screening color defectives. Both tests are more sensitive than other table tests. While the H-R-R chart screening series 1-5 eliminated too many normals, it detected all color defectives in the investigated group. These charts picked out color defectives which could not be found by the Nagel anomaloscope and the School of Aviation Medicine Color Threshold Tester. The quantitative classification of the red-green deficient subjects agrees fairly well with that of the Nagel anomaloscope but more nearly with the School of Aviation Medicine Color Threshold Tester. The qualitative classification of protans was absolutely correct and that of the deutans fairly reliable in comparison with the anomaloscope. The ability to classify qualitatively exceeds that of the Ishihara tables. The quantitative and qualitative classification of blue-yellow defects could not be satisfactorily controlled because of lack of a reliable standard. Some studies concerning memorization are reported. The H-R-R charts lend themselves to verbal errors. Improvement in administration and printing of plates is recommended. The H-R-R charts have a wider application than a simple pass-or-fail test. The experience with the charts establishes the opinion that, with further development, they will be very useful. (Author's summary, abbreviated)

Schmidt, L. 1952
INVESTIGATIONS ON THE PRONE POSITION FOR PILOTS (Versuche zur liegenden Unterbringung des Flugzeugfuehrers). — (Translated by K. H. Doetsch from Zentrale für Wissenschaftliches Berichtswesen der Luftfahrtforschung, Berlin. UM 1297, May 13, 1944). Royal Aircraft Establishment (Gt. Brit.). Library Translation no. 396, Jan. 1952. 15+10 p. DN-Aer (T.I. no. 56815) UNCLASSIFIED

The "B. 9" is a twin engine, cantilever, low-wing monoplane of composite construction, stressed for an ultimate factor of 22 g. The pilot is placed in the fuselage nose. The bed on which the pilot lies is provided with for and aft adjustment and an adjustable chin rest. There are arm rests, and the legs are slightly bent. A back parachute replaces the conventional chest-type parachute. Modified stick controls (in preference to wheel controls) are used. Brakes and rudder are controlled by the feet in the conventional manner. All secondary controls and switches are situated on the port side of the fuselage. The prone position was considered comfortable by the pilots. Fatigue was experienced by some in the nape of the neck and in the shoulders. The chin rest was considered disturbing in horizontal flight. The relative position of the field of view, as compared to the seated position, shifted into a position with the main line of vision declined 30° below the horizon. Flight handling was not encountered difficult. The feeling of "suspension" was absent in the vertical dive. Maximum accelerations of 8.5 g in pullouts and 6 g in steep spirals were tolerated over several seconds.

Schreiber, H. 1952
THE MAZE OF ACCIDENT STATISTICS. — Interavia (Geneva), 7 (4): 196. 1952. In English.
DCAA

In pointing out the problematic aspects of aviation-accident statistics, the author presents a comparative tabulation of accidents that occurred on American and non-American airlines and other means of transportation (bus, railway, private car, etc.), covering the years 1942 to 1952 (expressed in annual fatalities per 100 million passenger miles). The reliability of such statistics should, however, not be overestimated. Only if the statistics are limited to clearly defined operating groups (e.g., transatlantic flights) can reliable clues to air-transportation safety be obtained. It may be stated that the optimum condition of safety in passenger transportation (the "saturation point" of safety) is reached when the probable total traveling time up to the expected accident coincides with the average life expectancy of the passenger. This point has been already reached by many airlines.

Schreuder, O. B. 1952
AVIATION TOXICOLOGY, CURRENT TRENDS. — Military Surgeon, 111 (1): 14-23. 1952.
DLC (RD1. A7, v. 111)

An intensive research program on aviation toxicology has been put into effect by the U. S. Air Force, with participation of government and industrial research laboratories. Among the sources of toxic substances encountered in flight, radio and electronic equipment rate highest (accounting for 56% of all incidents), followed by hydraulic fluids, aviation fuel, and batteries. Decomposition products of fire extinguishers have been the subject of special studies. As a result of the findings, carbon tetrachloride, which rates among the most toxic, is being abolished in favor of either carbon dioxide or trifluorobromomethane. Handling of fuels, paint removers, grease removers, paints, lubricants, and oxidizing agents represents the principal toxic hazard in ground operations. Toxicity data and approximate lethal doses are tabulated. In conclusion, toxicological problems of the future (jet fuels, atomic fuels, etc.) are outlined.

Schulze, H. A. 1952
FEAR OF FLYING. — U. S. Air Force Medical Service Digest, 3 (9): 29-31. 1952.
DSG (W2 A403u, v. 3)

The number of requests on the part of reserve officers in the U. S. Air Training Command, to be relieved of flying duty because of fear of flying, reached proportions of an "epidemic" between 1951 and the first half of 1952. An analysis of over 100 such cases is presented, with the objective of determining the principal etiological factors. It was found that 49% of the reserves in question had volunteered for duty, while 42% had been recalled. The average age was 30. A great number of the officers had served as pilots for a considerable length of time during World War II, part of it on combat flying missions; many had been decorated for bravery. The study revealed the following principal underlying motivations: fear of renewed combat duty; lack of confidence (technical and tactical advances in aviation had not been caught up with by supplementary training); resentment against being reassigned to combat duty, in preference to those who had never served yet; a more sober and cautious outlook on life in general; newly acquired family obligations; lack of patriotic incentives (as compared to World War II); and lack of incentives in terms of future career prospectives. Administrative and disciplinary aspects are discussed.

Schwab, R. S. 1952
THE TREATMENT OF MOTION SICKNESS. — Med. Clinics North America, 36 (Sept.): 1373-1380. 1952. DSG

In the pathogenesis of motion sickness several parts of the nervous system seem to be involved. The stimulation of the labyrinth directs nerve impulses to the vestibular part of the medulla and to the cerebellar, thalamic, and spinal centers. The spread from the vestibular to the vagus centers may be considered as the change from the sensory to the motor factors of the syndrome. With regard to the incidence of motion sickness two types of subjects may be distinguished: (1) persons sensitive to all kinds of motion regardless of duration and violence, and (2) persons who become sick if the motion is vigorous enough but adapt themselves gradually if the motion is continuous. As a prophylactic measure, excessive eating and drinking should be avoided; anxiety or tension should be eliminated by initial reassurance and encouragement. When motion sickness becomes acute, the pylorus closes and gastric motility is directed outward from the stomach and not into

the small intestine. The most successful medication for motion sickness consists of a combination of a sedative with an atropine-like drug such as scopolamine. Antihistaminics with scopolamine, amphetamine, and barbiturates can be combined according to the individual conditions. Should actual motion sickness begin with vomiting, the best treatment is the use of 0.6 mg. of scopolamine hydrobromide subcutaneously. The action of several proprietary drugs (Lergigan, Phenergan, Benadryl) is discussed.

Seabra, P. 1952
[OXIDASE AND IMMUNITY] Oxydase und Immunität. — Zeitschrift für Hygiene und Infektionskrankheiten (Berlin), 135 (6): 499-504. 1952. In German. DSG

Humans suffering from an infectious disease (e.g., whooping cough) may be benefited by high-altitude flights. On the other hand, injurious effects are also possible, due to a lowering of the body's resistance.

This conclusion is reached by the author after showing that the immunity of rats injected with Borrelia gallinarum was lowered at a simulated altitude of 8,200 feet. In this experiment, the author was able to correlate the resistance to infection to the mechanism of oxidase storage in the blood.

Seanor, H. E. see Beck, G. J., 1952

Sébas, R. 1952
and R. Benchimol
[THE HUMAN EYE AT HIGH SPEEDS] O ôlho humano nas altas velocidades. — Brasil-médico (Rio de Janeiro), 66 (20-22): 289-292. 1952. In Portuguese. DSG

The following factors affecting human vision in high-speed flight are briefly analyzed: air currents (demanding slanted and streamlined optical surfaces), vibration, acceleration, and optical distortion due to shock waves. Vision during emergency bailout, visual accomodation, as well as effects of temperature on vision and the latent period of visual perception are discussed.

Sébas, R. see also Benchimol, R., 1952b
Sechrest, L. B. see Hemphill, J. K., 1952b

Selkurt, E. E. 1952
INFLUENCE OF HYPOXIA ON RENAL CIRCULATION AND ON THE EXCRETION OF ELECTROLYTES. — Amer. Jour. Physiol., 171 (3): 766. 1952. DLC (QP1.A5, v. 171)

Renal hypoxia was induced in pentobarbitalized dogs by alternate perfusion of the intact kidney with arterial and venous blood. When arterial was changed to venous blood, the oxygen content decreased 4.5 volume %. After hypoxic perfusion, the para-aminohippuric acid clearance increased 25% (suggesting renal hyperemia), the creatinine clearance tended to decrease, and the excretion of Na and K as well as the volume of urine increased.

Sellers, A. H., 1952
G. D. Caldbick, and J. B. Hardie
A STUDY OF THE DIPHTHERIA EXPERIENCE IN THE RCAF, SUBSEQUENT TO THE USE OF DIPHTHERIA TOXID. — Royal Canadian Air Force. Inst. of Aviation Medicine, Toronto. Jan. 1952. 20+7 p. (Project no. IAM 25-5-P3). DSG (W2 DC215r) UNCLASSIFIED

Following a severe outbreak of diphtheria in 1941, the Royal Canadian Air Force introduced a generalized program of Schick testing and immunization of susceptive individuals, using two doses of alum-precipitated diptheria toxoid. Approximately 50% of all adult male personnel were found to be susceptible to the disease as judged by the Schick test. These were slight reactions, and it was possible to carry out the program without interfering with the training schedule. The diphtheria immunization program in the RCAF was effective. No outbreaks of diphtheria occurred, despite ample opportunity for infection. All cases were sporadic. The total rate of attack was low. The incidence of diphtheria among Schick-positive persons was as low as that among persons who were Schick-negative on entry. If a diphtheria immunization program should be called for in the Armed Forces, such a program (2 doses of A. P. toxoid, 3 doses of plain toxoid, or appropriate doses of any combination antigen, such as TABTD) should include provisions for an annual reinforcing dose.

Sellers, A. H., 1952a
B. C. Coles, and G. D. Caldbick
SCARLET FEVER AMONG RCAF PERSONNEL WITH SPECIAL REFERENCE TO THE USE OF SCARLET FEVER TOXIN. — Royal Canadian Air Force. Inst. of Aviation Medicine, Toronto. Oct. 16, 1952. 17 p. Project no. IAM 25-9-P1. DSG (W2 DC215r). UNCLASSIFIED

The effectiveness of scarlet-fever immunization in terms of incidence, severity, and clinical course of the disease was studied on 1,027 cases in the Royal Canadian Air Force. The scarlet-fever attack rates observed suggest that the incidence is highest in non-immunized Dick-positive (i. e. susceptible) personnel, and lowest in fully immunized Dick-positive personnel. The attack rates for Dick-negative personnel fall between these two.

Sells, S. B., 1952
F. J. Frese, and W. H. Lancaster
RESEARCH ON THE PSYCHIATRIC SELECTION OF FLYING PERSONNEL. II. PROGRESS ON DEVELOPMENT OF SAM GROUP INK-BLOT TEST. — School of Aviation Medicine, Randolph Field, Tex. April 1952. v+77 p. (Project no. 21-37-002, Report no. 2; TIP U22053). UNCLASSIFIED

An empirical sign key was developed for quantitative scoring of the USAF School of Aviation Medicine group ink-blot test, an adaptation of the Rorschach psychodiagnostic method to large-scale psychiatric screening of flying personnel. The sign key had correlations of 0.13 with pilot stanine score and 0.46 with the pass-fail adjust-

against lighter backgrounds of similar contrast ratios. A light red in the highest chroma was superior to any other hue. (TIP abstract)

[Shaw, W. C.] 1952
FUTURE HIGH-FLYING TRANSPORTS POSE TOUGH AIR CONDITIONING PROBLEMS. — SAE Jour., 60 (6): 78. 1952. DLC (TL1. S5, v. 60)

An analysis of the physiological effects of high-altitude flight on the human organism, combined with an investigation of related technical problems, have lead the Committee A-9 on Aircraft Airconditioning Equipment of the Society of Automotive Engineers (headed by W. C. Shaw) to draw up a number of recommendations. Foremost among the proposed safety measures are methods of preventing uncontrolled explosive decompression. Potential blowout areas (e.g., windows) should be so designed as to allow for sufficient time to use protective oxygen equipment in case of breakdown. Pressurization equipment should be in duplicate, and a spare supply of oxygen should be readily available. Such factors as decreased humidity, radiation, and low temperatures at high altitude should be taken into consideration when designing preventive measures.

Shibe, E. H. see Zachert, V., 1952, 1952a
Shocket, E. see Jackson, M. M., 1952
Shrinagesh, M. M. see Hall, A. L., 1952b, 1952c
Sieker, H. O. see Pryor, W. W., 1952

Simon, C. W. 1952
INSTRUMENT-CONTROL CONFIGURATIONS AFFECTING PERFORMANCE IN A COMPENSATORY PURSUIT TASK. — Feb. 1952. vi+40 p. Antioch Coll., Yellow Springs, Ohio (Contract W33-038-ac-19816); issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base (RDO no. 694-31) (TIP U25390). UNCLASSIFIED

Tests were conducted to determine if a significant interaction existed between the position of the pointer and a limited number of control positions with a continuous, compensatory pursuit task. The 16 pointer-control combinations were composed of 4 zero positions of the pointer and 4 control conditions: a rotary knob located below the dial, a short lever located below the dial and extending upward from its pivot point, a lever as before but extending downward, and a lever located above the dial and extending downward. With the vertical lever control, performance with vertical pointers was generally better than with horizontal ones. No significant differences were found with the knob control. Performance was generally superior when the relative positions of the pivot point and moving end of the pointer corresponded with those of the lever. Performance was facilitated when the moving end of the control was extended toward the instrument dial. Different pointer-lever configurations yielded equivalent performance scores. Performance among pointer positions did not differ significantly when the interaction effects were considered. The knob control gave better results than the lever controls. Male subjects obtained higher scores than female subjects. (TIP abstract, abbreviated)

Simon, C. W. see also Fitts, P. M., 1952a
Simons, D. G. see Henry, J. P., 1952

Simonson, E. 1952
and J. Brozek
FLICKER FUSION FREQUENCY. BACKGROUND AND APPLICATIONS. — Physiol. Reviews, 32 (3); 349-378. 1952. DLC (QP1. P45, v. 32) UNCLASSIFIED

A description is given of the equipment and procedure of measuring fusion frequency of flicker (FFF) (i.e. that rate of successive light flashes at which the sensation of flicker disappears and the light becomes "steady"). The correlations between FFF and age, sex, body build, personality, and intelligence are reviewed from literature data. A section of the paper is dedicated to the discussion of the effect of various agents on FFF: anoxia, CO_2 inhalation, and exposure to acceleration decrease, and hyperventilation increases its value. (183 ref.) (cf. Simonson, E., 1952a).

Simonson, E. 1952a
and J. Brozek
FLICKER FUSION FREQUENCY. BACKGROUND AND APPLICATION. — June 1952. 26 p. Univ. of Minnesota. Lab. of Physiological Hygiene, Minneapolis (Contract AF 33(038)-21914); issued by School of Aviation Medicine, Randolph Field Tex. (Project no. 21-32-004, Report no. 2) (AD 14 766). PB 110757

Same as the paper, Simonson, E., 1952.

Simonson, E. see also Brozek, J. 1952
Siri, W. see Lawrence, J. H., 1952

Sleight, R. B. 1952
and T. R. Austin
THE HORIZONTAL-VERTICAL ILLUSION IN PLANE GEOMETRIC FIGURES. — Jour. Psychol., 33 (2): 279-287. 1952. DLC (BF1. J67, v. 33)
Reprint also issued as: Johns Hopkins Univ. Inst. for Cooperative Research, Baltimore, Md. Report no. 166-I-144, [1952]. (Contract N5-ori-166, Task order 1); issued by Office of Naval Research. Special Devices Center, Port Washington, N. Y. (Project no. NR-784-001) (TIP U23079). UNCLASSIFIED

The "horizontal-vertical illusion" is defined as a perceptual phenomenon by which the vertical dimension is seen as perceptually longer than the horizontal dimension. Experiments carried out on eight subjects requested to describe a series of geometric figures displayed tachistoscopically, revealed that the illusion is confined to a certain type of figures only and is largely dependent on individual factors.

Sleight, R. B. 1952a
and G. Duvoisin
AN ANNOTATED BIBLIOGRAPHY OF FORM PERCEPTION. — Aug. 11, 1952. v+28 p. Johns Hopkins Univ., Baltimore, Md. (Contract N5ori-166, Task order 1); issued by Office of Naval Research, Naval Research Lab., Washington, D. C. JHU Report no. 166-I-153 (Project no. NR-507-470) (TIP U24152). PB 111516

A bibliography of forty studies, primarily of a quantitative nature, has been compiled on the discriminability of geometric shapes when perceived visually. Criteria employed in the reported studies include accuracy of reports at a distance, extension of form field, and intensity threshold. These studies have been outlined according to purpose, materials and procedures, and results and conclusions. These selected studies illustrate the incompleteness of quantitative research in the field of form perception. (Authors' summary)

Smedal, H. A. 1952
AIR TRANSPORTATION OF PERSONS WITH CARDIO-RESPIRATORY DISEASE AND/OR INJURY. — Jour. Aviation Med., 23 (1): 33-37. 1952. DLC (TL555.A1A4, v. 23)

Normal individuals show signs of oxygen lack when an altitude of 10,000 feet has been reached. The pulse rate begins to increase and the blood pressure becomes slightly elevated. If the altitude is reached slowly as in flight, most individuals adjust readily to the changed environment. Individuals with cardiac disability often tolerate moderate anoxia remarkably well; they should, however, be protected from simultaneous motion sickness or anxiety states. If pressurized cabins are used, oxygen equipment should be provided for the case of sudden failure of pressurization. — Patients with pulmonary disease, on the other hand, are more liable to experience severe oxygen lack even at low altitudes. Oxygen (or a mixture of 30% oxygen and 70% helium) should be breathed during the entire flight.

Smedal, H. A. see also Rosenblith, W. A., 1952

Smith, Allen D. 1952
MEDICAL AIR EVACUATION IN KOREA AND ITS INFLUENCE ON THE FUTURE. — Military Surgeon, 110 (5): 323-332. 1952.
DLC (RD1.A7, v. 110)

A detailed illustrated account of the air evacuation service in Korea is presented. Air evacuation was effected in the following stages: (1) by helicopter from the front lines to the mobile army surgical hospitals in the rear; (2) by C-47 Skytrains to hospitals within Korea; (3) by C-54 Skymasters from Korea to Japan; and (4) by various aircraft from small hospitals in southern Japan to larger hospitals farther north in the Osaka and Tokyo areas. Among the advantages of air evacuation the following are discussed: the morale-building factor, the time element, personnel economy, material economy (less need for forward hospital facilities), economy of lives, economy of transportation (ground transportation saved for use by fighting troops), and increased range and mobility of operation. During the month of September, 1951, the 315th Air Division evacuated a total of 11,869 patients over a distance of 3,421,166 miles at a cost of 6.6 cents per patient mile.

Smith, Allen D. 1952a
AIRCRAFT EFFECTIVENESS PROGRAM: THE CONCEPT. — U. S. Air Force Medical Service Digest, 3 (9): 4-6. 1952.
DSG (W2 A403u, v. 3)

The principal duties of the flight surgeon in promoting air crew effectiveness are enumerated and briefly discussed, such as: administration of physical and psychological examinations; classification of flying personnel; maintenance of mental health and physical fitness; care of aircraft casualties; prevention of accidents; prolongation of effective flying time of Air Force personnel; prevention, diagnosis, and treatment of disorders and injuries peculiar to flight; assistance and advice regarding aeromedical requirements in connection with the design and development of aircraft and related equipment; supervision of, and assistance in, air rescue and air evacuation missions, and indoctrination of flyers in the physiological and psychological aspects of flight. Operational and administrative phases of an aircrew effectiveness program are outlined.

Smith, C. W. see Bean, J. W., 1952b

Smith, E. A. 1952
NOISE IN AIRCRAFT. — Aeronautics (London), 26 (2): 69-70, 72. 1952.
DLC (TL501.A5512, v. 26)

Great progress has been made over the past years in combating noise and vibration in aircraft. By utilizing such factors as noise level distribution within the cabin and by the use of proper insulation (fiber glass impregnated with a synthetic resin) the designers have succeeded in minimizing the effects of noises. The introduction of the pressurized cabin and the arrival of turbine- and jet-powered aircraft (decrease in vibration) have contributed further toward eliminating excessive noises.

Smith, Falconer see Smith Willie W., 1952
Smith, Helge see Nielsen, M., 1952
Smith, Joann see Gibson, E. J., 1952; Groot, S. G., 1952
Smith, Karl U. see Lincoln, R. S., 1952
Smith, Paul K. see Chinn, H. I., 1952a, 1952b, 1952f
Smith, Robert G. see Moore, J. V., 1952

Smith, William B. 1952
THE REMINISCENCES AND OBSERVATIONS OF A CIVILIAN FLIGHT SURGEON. — Jour. Aviation Med., 23 (5): 520-525, 537. 1952.
DLC (TL555.A1A4, v. 23)

The development of aviation and the growing importance of the flight surgeon in the selection of flying personnel are discussed. In order to improve the selection methods, the following factors should be considered: (1) Aviation medicine being a specialty, the flight surgeon should have a specialized medical training before he participates in personnel selection. (2) In order to do a good job, proper pay should be given to these physicians. (3) Only one type of physical examination should be instituted for all pilots (military, civilian, and private); physical standards should be based on statistics and experience. (4) Flight surgeons are primarily responsible for flying safety; to gain more recognition, their public relations should be improved.

Smith, William M. 1952
SENSITIVITY TO APPARENT MOVEMENT IN DEPTH AS A FUNCTION OF STIMULUS DIMENSIONALITY. — Jour. Exper. Psychol., 43 (2): 149-155. 1952. DSG

Continuous change in angular size of an object for which the usual distance clues are not available (e.g., of a luminous disc seen in the dark) is ordinarily perceived as a movement of the object in the third dimension. It is the purpose of this study (1) to determine if there exists a difference in sensitivity to this apparent movement when images of familiar test objects (e.g., a baseball) are shown, and (2) to determine the effect of monocular and of binocular vision on the sensitivity to this apparent movement. The experiment was so designed as to measure reaction times in response to movement, supplemented with verbal reports from the test subjects. The test images and their changes in size were produced on a small screen by a projector, and the subject was instructed to press a key connected to a timing device at the instant apparent motion of the image on the screen was perceived. The experiment revealed the following results: (1) the reaction time (sensitivity) did not change with the type of test object (image) used nor with the apparent tridimensionality (brought out by the perspective of image design); and (2) reaction times to apparent movement were shorter in binocular than in monocular vision; and (3) marked individual differences were found. An interpretation of observations is attempted in the light of similar experimental results obtained by other authors.

Smith, Willie W., 1952
W. S. Cool, Falconer Smith, and P. D. Altland
EFFECT OF ALTITUDE-INDUCED POLYCYTHEMIA AND RETICULOCYTOSIS ON TOLERANCE OF RATS TO RADIATION. — Amer. Jour. Physiol., 170 (2): 396-400. 1952.
DLC (QP1.A5, v. 170)

Rats exposed to a simulated altitude of 18,000 feet, 4 hours a day for 5 weeks, were irradiated with single X-ray doses of 525 r, 625 r, and 760 r, respectively. The experiments revealed the following findings: (1) The mortality of altitude-acclimatized rats and ground controls was the same after the dose of 525 r; after 625 r and 760 r the mortality among altitude-acclimatized rats was greater than among ground controls. (2) When altitude exposure was discontinued at the time of irradiation, the higher mortality rate persisted. (3) Before irradiation the number of circulating reticulocytes in the altitude-acclimatized animals was two to three times that of the ground controls; following irradiation the number of circulating reticulocytes dropped to near zero in all groups, but increased 10 days after 525 r and 15 days after 625 r, with higher rate of increase in the altitude-acclimatized group. (4) Reduction in hematocrit value was almost the same in altitude-acclimatized groups and ground controls. (5) Altitude exposure showed no effects on leucocyte count or body weight. — Contrary to expectations, the experiments have shown that altitude-induced erythrocytic hyperplasia results in weakened tolerance to radiation.

Smythe, C. M. see Chinn, H. I., 1952f
Songar, A. see Terzioğlu, M. N., 1952

Specht, H. 1952
TOXICOLOGY OF TRAVEL IN THE AEROPAUSE. — In: Physics and medicine of the upper atmosphere: a study of the aeropause, p. 171-181. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico Press, 1952.
DLC (RC1050.U5, 1952)

The toxicity of the volatile components of human excreta represents an important factor to be considered in the closed environment of a craft traveling through the aeropause. The author reviews the basic toxic components of exhaled air, sweat, urine, flatus, and feces and discusses possible means of disposing of or neutralizing them. Exhaust fumes, vapors from hydraulic fluids, batteries, etc. constitute additional sources of toxic products, but can be controlled by existing safety precautions. In the absence of experimental evidence it is difficult to predict other potential hazards that may be created by the action of cosmic or solar rays, or by the absence of the gravitational pull.

Specht, H. see also Marshall, L. H., 1952

Spencer, J. 1952
COMPARISON OF TWO VISUAL WARNING SYSTEMS IN AIRCRAFT. — June 1952. 3 p. RAF Inst. of Aviation Medicine (Gt. Brit.), Farnborough; issued by Flying Personnel Research Committee (Gt. Brit.). Report no. FPRC 790 (TIP U68206) UNCLASSIFIED

An airborne comparison has been made between two types of systems for presenting visual warnings of certain types of failure that are likely to occur in aircraft. The experiment involved 10 pilots who had to complete a low-level cross-country flight in a Harvard IIb aircraft while responding to the artificially produced warnings. In one case, warnings were dispersed around the instrument panel, in the other, they were central-

ised on a "warning panel" which included two flashing, attention-getting lights.

Using as criterion the response time between exposing the signal and executing the correct response, the centralised warning system was superior (statistically significant at p = 0.05 level). The average response time to the central warning system was 66% of the average response time to the dispersed warning system. (Author's summary)

Spragg, S. D. S. 1952
and J. Kanwisher
THE EFFECTS OF BRIGHTNESS AND COLOR OF ILLUMINATION ON PERFORMANCE OF A COMPLEX PERCEPTUAL MOTOR TASK (FLYING IN A LINK TRAINER). — July 1952. 13 p. Univ. of Rochester, N. Y. (Contract W33-038-ac-18317; issued by Wright Air Development Center. Aero Medical Lab., Wright Patterson Air Force Base, Ohio. WADC Technical report no. 52-203 (RDO no. 694-41; AD 126). PB 108487

Subjects flew modified Charley courses in a task that was almost entirely visual. Performance was measured in terms of deviations from the calculated perfect course in altitude, compass heading, air speed, and vertical speed. Various brightnesses and colors of light were used for illumination of the instrument panel. The results showed color or illumination to be an unimportant variable, provided the colors used were equated for brightness. Each experiment yielded superior performance at the higher brightnesses, but the differences in several instances were not satistically significant, chiefly because of the variability due to the instrument. (AD abstract)

Stauffer, F. R. 1952
ACCELERATION PROBLEMS OF NAVAL AIR TRAINING. I. NORMAL VARIATIONS IN TOLERANCE TO POSITIVE RADIAL ACCELERATION. — Naval School of Aviation Medicine, Pensacola, Fla. March 20, 1952. 8+22 p. (Project report no. NM 001 059.02.09; TIP U22218). UNCLASSIFIED

Data are presented on 215 subjects to show the normal variations in tolerances to certain positive g stresses. These data show: (a) the range in tolerance of the normal population is fairly large; (b) the tolerance of the average population is fairly low; (c) the individual tolerance fluctuations under "normal" conditions are fairly large; (d) critical symptoms (blackout and unconsciousness) are separated in the average individual by only small g-levels, and short time intervals. Some of the uses of the human centrifuge as an aid to flight training have been presented. It has been pointed out that selection of pilots for g-tolerance cannot be done as yet on the human centrifuge although this machine can supply valuable practical training for certain selected individuals. Determination of a man's ability to "fly g" must still be made in actual flight. (From the author's summary)

Stebbins, E. L. 1952
PRESENT STATUS OF CERTIFICATION IN AVIATION MEDICINE. — Jour. Amer. Med. Assoc., 149 (16): 1488. Aug. 16, 1952. DSG

The following tentative schedule of a training course toward certification in aviation medicine was submitted for review to the Advisory Board for Medical Specialties by representatives of the American Board of Preventive Medicine and of the Interim Board of Aviation Medicine, in February 1952: (1) successful completion of two academic years of graduate studies in (a) the elements of preventive medicine, (b) the basic sciences applying to aviation medicine, and (c) at least one year of aviation medicine in an accredited medical school; (2) at least one year of residency training in aviation medicine approved by the Council on Medical Education and Hospitals (American Medical Association) and by the American Board of Preventive Medicine; and (3) a minimum of 6 years of academic training, residency training, or practical experience in aviation medicine in addition to the internship year. The proposal was temporarily rejected, pending expansion of the number of accredited schools (there were only two at the time of the application). A closer definition of training requirements and lifting of the restriction of applicants to members of the Aero Medical Association was likewise demanded.

Steggerda, F. R., 1952
W. C. Clark, and I. E. Danhof
EFFECTS OF ALTITUDE AND DIET ON THE CO_2 CONTENT OF FLATUS IN MAN. — Federation Proceedings, 11 (1I): 154. 1952. DSG

When 300 cc. of room air were injected into the lower colon of man, the CO_2 content in the collected flatus increased up to 40% while ascending to a simulated altitude of 25,000 feet. Flatus undiluted with room air reached CO_2 concentrations of 80% within 10 minutes at an altitude of 35,000 feet. The nature of the diet is an important contributing factor, low-calorie and low-residue diets prolonging the transit time from the stomach to the lower colon.

Steggerda, F. R., 1952a
W. C. Clark, and I. E. Danhof
THE CONTINUOUS RECORDING OF TONIC AND ACTIVITY PRESSURES IN THE GASTROINTESTINAL TRACT AT VARIOUS ALTITUDES. I. FACTORS AFFECTING THE TONE AND ACTIVITY OF THE COLON OF MAN UPON GOING TO ALTITUDE. — School of Aviation Medicine, Randolph Field, Tex. March 1952. iv+15 p. (Project no. 21-23-025, Report no. 1; TIP U22281). PB 106799

The tone and activity of the colon distended by 300 cc. of room air were measured at ground level and on ascent to simulated altitudes of 12,000 to 25,000 ft. Inhalation of oxygen was commenced at 10,000 ft., and fluids were ingested at 12,000 and 15,000 ft. Ascent to 12,000 ft. without fluids slightly decreased tone pressures and markedly increased colonic activity. Oxygen inhaled at 12,000 ft. increased tone from 98 to 101% during a 20- to 25-min. interval and from 92 to 99% during a 40- to 45-min. interval; colonic activity increased 30 and 45% during the 20- to 25- and 40- to 45-min. intervals respectively.

Ingestion of water and milk produced an average increase of 49% in colonic activity compared to no fluid ingestion. A slight increase in colonic activity with the ingestion of milk as compared to water was apparently caused by the secretagogue properties of milk. Increased colonic activity at altitude appeared to be due to gas distention and the resulting adaptation of the colonic musculature. (TIP abstract)

Steggerda, F. R., 1952b
W. C. Clark, and I. E. Danhof
THE CONTINUOUS RECORDING OF TONIC AND ACTIVITY PRESSURES IN THE GASTROINTESTINAL TRACT AT VARIOUS ALTITUDES. II. THE EFFECTS OF ALTITUDE ON THE VOLUME AND COMPOSITION OF COLONIC FLATUS IN MAN. — School of Aviation Medicine, Randolph Field, Tex. March 1952, iv+17 p. (Project no. 21-23-025, Report no. 2; TIP U22215). PB 106800

The volume and composition of flatus was studied on 8 subjects exposed to ambient pressures simulating 12,000- and 25,000-ft. altitudes. Before the tests, 300 cc. of air was injected into the colon. Samples were collected after a 45-min. period under the following test conditions: with and without the subjects breathing pure oxygen at 12,000 ft., with breathing pure oxygen at 25,000 ft., and with and without ingesting a pint of either water or milk 20 min. after the start of the experiment. The gas samples were analyzed for CO_2 and O_2; average concentrations at ground level were 9.3 and 13.9%, respectively. At 12,000 ft., the CO_2 increased to 13.6% when O_2 was not breathed and 14.7% when O_2 was breathed; at 25,000 ft. it increased to 21.6%. O_2 decreased to 12.1, 10.6, and 10.0%, respectively, under these conditions. Average collectable flatus increased from 143 cc. at ground level to 808 cc. at 25,000 ft. The increase in CO_2 and decrease in O_2 were greater when water was ingested and still greater when milk was consumed, the changes with milk being attributed to its greater secretagogue activity. Changes in gas volume and composition were minor following a regimen of sulfathaladine medication, indicating that fermentative gases contribute only slightly to total colonic gases. (TIP abstract)

Sterner, J. H. 1952
STANDARDS OF NOISE TOLERANCE. — Indus. Med. and Surg., 21 (4): 165-170. 1952. DSG

The literature dealing with standards of noise tolerance in man reveals a great discrepancy of values. A brief summary of representative standards is presented. In an endeavor to narrow down these findings, the author designed, distributed, and evaluated 222 questionnaires on the subject of noise tolerance. The opinion on the following criteria was solicited: (1) status of present information related to noise-tolerance standards; (2) the single over-all intensity value considered "safe" for continuous exposure; (3) the single over-all intensity value above which there is a probability of a permanent deafening effect; and (4) a frequency-intensity curve giving maximum "safe" values for continuous exposures based on previous findings. The replies, broken down by professions, are tabulated and represented graphically. The median values for safe and harmful levels appear to be 85 and 110 decibels, respectively.

Sterner, J. H. 1952a
STANDARDS OF NOISE TOLERANCE. — In: Noise—causes, effects, measurements, costs, control, p. 161-166. Ann Arbor, Mich.: Univ. of Mich. Press, 1952. DLC (RA772.N7M5)

Same as the paper, Sterner, J. H., 1952.

Sternlicht, I. R. see Gordon, J. N., 1952
Stevens, M. R. see Gee, A. H., 1952, 1952a

Stieglitz, W. I. 1952
COCKPIT DESIGN AND SAFETY. — Aeronaut. Engin. Rev., 11 (10): 36-41, 124. 1952. DLC (TA501.A326, v. 11)

A review of studies on functional design and coordination of cockpit and instrument arrangement leads to the following conclusions: (1) the controls should be so designed as to serve as extensions of the pilot's motor system; (2) adequate separation of controls would counteract substitution errors most effectively—experiments have shown, however, that adequate spacing is unfeasible in the average airplane cockpit; (3) as a substitution measure, shape coding of critical knobs has proven highly effective (knob shapes should be disigned in a suggestive fashion, e.g. a miniature wheel for the landing gear); (4) standardization of cockpit arrangement has been partly accomplished with great success; (5) physiological characteristics (such as reach measurements) have to be considered — anthropometric data should be used to the fullest; (6) control motions should correspond to habitual patterns (e.g. clockwise rotation should produce increase in output like in radio volume control); (7) emergency controls should be easily identifiable and readily accessible.

Storstein, O. 1952
THE EFFECT OF PURE OXYGEN BREATHING ON THE CIRCULATION IN ANOXEMIA, IN PATIENTS WITH LUNG AND HEART DISEASES AND NORMAL INDIVIDUALS SUBJECTED TO EXPERIMENTAL ANOXEMIA. — Acta medica scandinavica (Stockholm), Suppl. 269. 185 p. 1952. In English. DSC (W1 AC8552, v. 269)

The effects of oxygen breathing (97%) were investigated on 12 normal subjects after 1/2 hour of low-oxygen breathing (9.5, 12, or 15% O_2) and compared with the effects of oxygen administration in anoxic conditions in patients with pulmonary or cardiac diseases and with anemia. In the normal subjects, oxygen breathing increased the arterio-venous oxygen difference, failed to decrease lung ventilation, and did not change the heart rate or the systemic blood pressure. The pulmonary arterial hypertension provoked by the acute anoxia was eliminated by breathing of O_2 and pulmonary resistance was reduced. The work

of the right ventricle which had increased under the influence of anoxia, decreased proportionally with administration of O_2.

[Stovall, W. R.] 1952
AIRPLANE PILOTS WARNED ON USE OF WEIGHT REDUCERS. — New York Times, May 26, 1952, p. 81 (col. 5). 1952. DLC

A warning was given to all airplane pilots by Dr. W. R. Stovall, chief of the medical division of the Civil Aeronautics Administration, not to use amphetamine or its derivatives for the purpose of reducing weight. The drug affects the central nervous system in varying degrees depending on the individual. Two recent accidents in England could be unmistakably attributed to the fact that the pilots had previously taken Dexedrine for reducing purposes.

A test on the influence of alcohol was recently carried out by the training center of the Danish Airlines at Copenhagen under simulated conditions (using the Link trainer). It was found that even small amounts of beer produce measurable symptoms of intoxication, which would impair safe performance of the pilots.

Stovall, W. R. 1952a
THE SPECIALTY OF AVIATION MEDICINE. — Jour. Aviation Med., 24 (5): 419-420, 473. 1952. DLC (TL555.A1A4, v. 23)

The conditions necessary for the development of a medical specialty such as aviation medicine are analyzed in detail. The contributions of Paul Bert, the distinguished physiologist, are noted. In order to exploit the possibilities of this new specialty, the great disparity in the rates of development of engineering and of aviation medicine has to be leveled off. Opportunities for specialized training, just as in other medical fields, must be provided and should include internship, residence, graduate clinical experience, and postgraduate "refresher" courses. (cf. Stovall, W. R., 1952b.)

Stovall, W. R. 1952b
[THE SPECIALTY OF AVIATION MEDICINE] La specialité de la médecine aéronautique.—Jour. Aviation Med., 23 (5): 518-519. 1952. In French. DLC (TL555.A1A4, v. 23)

This is a French translation of the paper, Stovall, W. R., 1952a.

Stover, A. D. see Wing, K. G., 1952
Strangeways, D. H. see Lucas, B. G. B., 1952

Strickland, B. A. 1952
DISCUSSION OF PAPERS BY DOCTORS DUNNAHOO, JOHNSTON AND POLLARD. — Jour. Aviation Med., 23 (1): 19, 76. 1952. DLC (TL555.A1A4, v. 23)

The necessity of thorough training of air evacuation personnel is stressed. All transport-type aircraft should be adaptable for transportation of either cargo or patients. Minor modifications in the equipment of transport planes make them more suitable for use in air evacuation.

Strickland, B. A., 1952a
C. Ferris, M. F. Tinkham, and E. Welch
MANAGEMENT OF PSYCHIATRIC PATIENTS DURING TRANSPORTATION BY AIR. I. MECHANICAL RESTRAINING DEVICES AND SEDATION. — School of Aviation Medicine, Randolph Field, Tex. April 1952. 20 p. (Project no. 21-39-001, Report no. 1; TIP U21509). PB 106827

As a method of controlling disturbed psychiatric patients during evacuation by air, the use of restraints is more desirable than sedation. Ankle and wrist restraints will usually suffice. Leather cuffs should be made more adjustable as to size and the locking mechanism improved as to security and quick release. A special chest and shoulder harness could be developed for immobilizing the upper chest and shoulders of the more unmanageable patients.

In giving sedatives, the oral method of administration is to be preferred. When injections are unavoidable, the subcutaneous injection of scopolamine is the procedure of choice. Paraldehyde and scopolamine are recommended above the barbiturates. (USAF School of Aviation Medicine abstract)

Strickland, B. A. see also Downey, V. M., 1952

Strong, H. L. 1952
THE AIR FORCE BOX SCORE. — Directorate of Flight Safety Research, Norton Air Force Base, Calif. [1952]. 9 p. [Paper presented at Conference on Problems of Emergency Escape in High Speed Flight, Sept. 29-30, 1952, at Wright-Patterson Air Force Base, Ohio]. (AD 14 342). UNCLASSIFIED

Experiences with conventional bailout are compared with bailout by means of an ejection seat on the basis of U. S. Air Force records and questionnaires. The majority of fatalities due to ejection occurred in bailout below 2000 ft. A device for the automatic separation of the pilot from the ejection seat would alleviate this problem. — Failure of the canopy jettisoning system was another cause of fatal or delayed escape. If the pilot could eject through the canopy, the number of accidents would be reduced. — Standardization of releases and other devices, as well as elimination of unnecessary equipment might remove mental obstacles often responsible for accidents. — Accidents could be further reduced by ejection-seat training particularly when procedures and location of releases are changed; improvement of parachute training (over 50% of all escape injuries are connected with landing) is badly needed; and adequate oxygen training under the supervision of a specialized technician, who could also cope with problems related to the use of altitude suits, would be most important.

Strughold, H. 1952
ECOLOGICAL ASPECTS OF PLANETARY ATMOSPHERES WITH SPECIAL REFERENCE TO MARS. — Jour. Aviation Med., 23 (2): 130-140. 1952. DLC (TL555.A1A4, v. 23)

Of the planets only Mars and possibly Venus have atmospheres capable of supporting life as we know it on the Earth. On Mercury the surface temperature is above the range of active life (over 400° C.) and on the larger planets below it (-150° to -200°C.). Venus has more than +100°C. in the lower atmospheric layers and about -25°C. in its upper atmosphere; and on Mars the atmospheric temperature ranges from +30° to -60°C. The Martian atmosphere has an extremely low oxygen tension (below 0.5 millibars, if any), which precludes the existence of all higher animals and plants. There are, however, lower plants (lichens and mosses) which may be able to store the oxygen, produced by photosynthesis, in their intercellular air spaces and may use it for their life processes. Heinz Haber has also advanced the hypothesis that life might exist as a "biological aerosol" in certain strata of the Venusian atmosphere.

Strughold, H. 1952a
FROM AVIATION MEDICINE TO SPACE MEDICINE. — Jour. Aviation Med., 23 (4): 315-318, 329 DLC (TL555.A1A4, v. 23)

A brief outline of the development of space medicine is given. The lower layer of the atmosphere supports propeller (up to 60,000 feet) and jet (up to 80,000 feet) flight and is the realm of conventional aviation medicine. Space medicine is concerned with an additional dimension, vertical, and its province is rocket flight which has no vertical limit. The transition from lower atmosphere to space conditions is gradual and various physiological functions of the atmosphere cease at different altitudes. These "space-equivalent" altitudes are: for anoxia, 52,000 feet; body fluids boil at 65,000 feet; heavy primaries of cosmic radiation penetrate to 120,000 feet; ultraviolet solar radiation, to 135,000 feet; optical appearance of the sky, 400,000 feet; and penetration of metrorites, 500,000 feet. The so-called upper atmosphere of physicists is, for all physiological purposes, equivalent to free space. Aviation at present is in an amphibious stage, in a transition between conventional flight and space flight.

Strughold, H. 1952b
PHYSIOLOGICAL DAY-NIGHT CYCLE IN GLOBAL FLIGHTS. — Jour. Aviation Med., 23 (5): 464-473. 1952. DLC (TL555.A1A4, v. 23)

The synchronization of the physiological diurnal cycle and of the environmental physical cycle poses various problems in modern intercontinental and global air transportation. Any abrupt geographic-physiologic phase shift is followed by changes in the "metabolic clock"; sleep and meal schedules, physiological factors such as body temperature, chemical composition of the blood, cell mitosis, nervous functions, etc., all are involved in the adaptation to a new cycle. — Considering geographical and aeronautical aspects, U. S. local time (EST), world time, and physiological time are compared; conclusions are drawn with regard to efficiency, medical care of sick and wounded, permissible frequency of change in cycle, etc. All this involves no serious medical problem, but it has many implications. Further research concerning accurate time pattern of symptoms, adaptation time, prophylaxis, and medical advice is needed.

Strughold, H. 1952c
BASIC ENVIRONMENTAL PROBLEMS RELATING MAN AND THE HIGHEST REGIONS OF THE ATMOSPHERE AS SEEN BY THE BIOLOGIST. — In: Physics and medicine of the upper atmosphere: a study of the aeropause, p. 23-34. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico Press, 1952. DLC (RC1050.U5, 1952)

With the ascent of rocket flight aeromedical considerations are being supplanted by space-medical problems. Until recently aviation physiology was primarily concerned with the lower half of the troposphere, the ecosphere (up to 13,000 ft.). The region beyond may be designated as the "hypoxic zone", followed by the "zone of anoxia" (beyond 52,000 ft.). Experiments designed to establish the duration of useful consciousness ("time reserve") revealed a value of 11-20 seconds at 46,000 ft. when breathing air and 15 seconds at 52,000 ft. when pure oxygen was breathed. This minimum value will remain constant even in space. Thus an altitude of 52,000 ft. may be termed "space equivalent". The introduction of the pressurized cabin has enabled man to surmount the anoxic barrier. — The physiological implications of meteorites (explosive decompression after collision), of cosmic and solar radiations, and of weightlessness are summarized. In accordance with these various factors a functional concept of space boundaries is to be set up.

Strughold, H. 1952d
THE PHYSIOLOGICAL DAY-NIGHT CYCLE IN GLOBAL FLIGHTS. — School of Aviation Medicine, Randolph Field, Tex. Special report, Oct. 1952. 3+9 p. (TIP U24746). UNCLASSIFIED

Same as the paper, Strughold, H., 1952b.

Strughold, H. see also Haber, F., 1952a
Strumza, M. V. see Binet, L., 1952, 1952a, 1952b, 1952c
Strumza-Poutonnet see Binet, L., 1952b

Stump, N. E. 1952
TOGGLE SWITCHES: ACTIVATION TIME AS A FUNCTION OF THE PLANE OF ORIENTATION AND THE DIRECTION OF MOVEMENT. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. Technical note WCRD 52-51, Sept. 1952. 10 p. (RDO no. 694-17; AD 12 170). UNCLASSIFIED

Seventy-two observations of the times required for each of 12 subjects to throw a double-throw spring-loaded toggle switch on and off were recorded for each of 6 directions of throw. The right direction was best, followed by up, down, and left directions. The up-down or right-left

activation of the switch in the frontal plane was accomplished more rapidly than activation under any other conditions studied. Data indicate that a Veeder counter could rotate at 10 units per second and be efficiently controlled by 99% of the operators regardless of plane or direction of throw. (AD abstract)

Stuntz, S. E. see Schaefer, K. E., 1952a
Stutzman, J. W. see Bauer, R. O., 1952; Brown, Barbara, 1952; Maison, G. L., 1952; Prochnik, G., 1952
Sucher, T. see Zachert, V., 1952c

Sullivan, A. 1952
and W. E. Hodges
STATISTICAL STUDY OF THE RELATIONSHIP BETWEEN THE EAR AND THE RESPONSE OF THE EAR TO PURE TONES AND WHISPERED VOICE. — Jour. Aviation Med. 23 (3): 229-236, 253. 1952. DLC (TL555.A1A4, v. 23)

The hearing acuity tests used in the selection of Royal Canadian Air Force personnel are discussed. The significance of the spoken-word tests, as compared to audiometric tests, is evaluated. The following procedure was applied to approximately 5000 candidates: After clinical examination, the subjects were given a forced whispered voice test. Test words were pronounced by the examiner after exhalation of breath. If the candidate failed to hear at least 50% of the words correctly, the test was repeated at a shorter distance. All subjects who failed the test at a distance of 20 feet were submitted to an otolaryngological examination.

A statistical analysis of the test results is given in some detail. 90% of the candidates passed both the audiometric and the whispered-voice tests; 9% failed the audiometric test; and 1% failed both tests. All persons who passed the audiometric test passed also the whispered-voice test. — The whispered-voice test has thus proved to be extremely unreliable and it is recommended that it be replaced by the electric audiometer test.

Sullivan, R. R. 1952
AIRPLANE PILOTS USING ORGANIC PHOSPHORUS INSECTICIDES CAN BE PROTECTED FROM TOXIC DUSTS AND SPRAYS. — Occupational Health, 12(7): 99-102, 104. 1952. DSG (W1 IN3744, v. 12)

Two case histories are reported concerning pilots engaged in spraying and dusting operations, who crashed after their eyesight had been affected by tetraethyl pyrophosphate (TEPP). The initial symptoms were soreness of the eyes, diminution of vision, headache, and nausea. Plasma cholinesterase was markedly depressed, pupils were constricted, there was irregular heart action (extrasystoles) and numbness of hands and feet. Protective equipment hitherto recommended has not given satisfactory results. Thus gasmasks could not be worn since low-flying maneuvers required the pilot's head to be above the windshield causing the mask to be torn off in the slip stream. However, the wearing of waterproof and dustproof clothing and gloves, thorough checking of tanks against leaks and compliance with regulations will reduce the danger. Further safety measures are: thorough washing after completed spraying missions, wearing of gas masks, at least during loading of tanks, frequent cleaning of cockpit and aircraft, and periodic checkups (cholinesterase tests).

Sutter, J. M. see Malmejac, J., 1952a
Swain, A. D. see Biel, W. C., 1952
Swanson, R. A. see Morsh, J. E., 1952

Switzer, R. E. 1952
FLIGHT SAFETY. — U. S. Air Force Medical Service Digest, 3 (9): 21-24. 1952. DSG (W2 A403u, v. 3)

In view of the relative increase of fatalities in relation to the number of aviation accidents during recent years (46 fatalities in every 100 major accidents in 1951, against 12.5 in 1930), the cooperation of the flight surgeon in the prevention of accidents is of the greatest value. Accident analysis has to be carried out with emphasis on detail with regard to contributing psychological, physiological, and pathological factors. A number of practical examples are cited.

Symonds, C. 1952
and D. Williams
NEUROPSYCHIATRY IN THE ROYAL AIR FORCE. — In: Medicine and pathology, p. 381-390. Ed. by V. Zachary Cope. London: Her Majesty's Stationery Office, 1952. DLC (RC971.C65)

Findings are summarized of three investigations on neuroses and psychiatric disturbances due to stress in flight training and in combat flight in the R. A. F. (undertaken between 1942 and 1945). Emotional tension (fear, lack of confidence, and prolonged exercise of courage) was found to be the most important element of stress. Approximately 70% of the total number examined showed some predisposition to neurosis. However, the authors come to the conclusion that mild predisposition should not be a reason for rejection from flight duty. The total incidence of psychological disorders in flying personnel was estimated to be less than 5%, the greater part of incidence occurring in pilots, wireless operators, air gunners, and navigators. Bomber crews showed the highest incidence. Air-sickness incurred during training could as a rule not be related to psychological factors. During the latter part of the war, more scientific methods of psychiatric assessment have been developed.

Tabusse, L., 1952
P. Biget, and A. Gomez
[PULMONARY FUNCTION TESTS IN THE SELECTION OF AIRCREW PERSONNEL]
L'exploration functionnelle pulmonaire dans la sélection du personnel navigant de l'Aviation. — Médecine aéronautique (Paris), 7 (4): 337-346. 1952. In French. DLC (TL555.M394, v. 7)

The following tests were performed (normal values given in parentheses): respiratory frequency (16 per minute); volume of inhaled air

(500-550 cm^3); ventilation (5-8 liters per minute); oxygen consumption (about 250 cm^3 per minute); vital pulmonary capacity (3,000 cm^3 in men and 2,000 cm^3 in women); maximal ventilation index (varies in normal subjects between 100 and 150 liters); and maximum speed of ventilation, i.e. the maximum volume of air exhaled in one second multiplied by 30 (100-120 liters). A CO_2 concentration of 2-4% in the air breathed produces the highest respiratory intensity. Voluntary apnea lasts 30-40 seconds. The Flack test is also applied (breathing against a pressure of 40 mm. Hg). — An electrocardiogram and an electroencephalogram are taken during the test. A normal subject passes 50% of the tests and his cardiac rhythm and electroencephalogram show only insignificant changes.

Tabusse, L. 1952a
and R. Jolly
[MODIFICATIONS OF THE ELECTROENCEPHALOGRAM OF ANOXEMIA IN MAN AFTER ABSORPTION OF VARIOUS SUBSTANCES] Modifications des tracés électro-encéphalographiques de l'anoxémie chez l'homme après absorption de certaines substances. — Médecine aéronautique (Paris), 7 (4): 529-533. 1952. In French. DLC (TL555.M394, v.7)

A total of 80 subjects were exposed to anoxemia induced by inhalation of a mixture of 7.5% oxygen in nitrogen. Arterial oxygen concentration and electroencephalogram were recorded. The anoxia encephalogram passes through three successive phases identified by slow theta waves, slow triangular waves, and finally delta waves (which precede loss of consciousness). According to anoxia resistance, the subjects tested fell into three groups: (1) subjects with great resistance, in which delta waves occurred after 2-2.5 minutes and at an arterial oxygen concentration of 55-65%; (2) subjects with medium resistance, 1-2 minutes and 65-75%, respectively; and (3) subjects with low resistance, less than 1 minute and above 75%. — The effects of various drugs on anoxemia resistance were studied. Administration of centropnein (a pancreatic hormone) or of glucose increased the resistance, Nautamine decreased it, and rutin combined with vitamin C had no effect on it.

Tabusse, L. 1952b
and P. Biget
[THE CO_2 TEST] Le test au CO_2. — Médecine aéronautique (Paris), 7 (2): 197-206. 1952. In French. DLC (TL555.M394, v. 7)

The carbon dioxide test, devised by Santenoise, represents a practical application of the fact that increasing amounts of CO_2 induce hyperventilation which manifests itself in a proportional increase of thoracic breathing movements. When the thoracic movements of healthy subjects, breathing air mixtures containing up to 2% CO_2, are recorded graphically on a revolving drum, the resulting "pneumogram" consists of a band of equally wide pulsations. When the CO_2 content is increased, pulmonic ventilation (and thoracic movement) is augmented, causing an increase in the amplitude of the pneumogram pulsations (a characteristic cone-shaped expansion of the pneumogram). This method is of diagnostic significance, as it was observed that in persons suffering from certain respiratory defects (such as asthma and silicosis) the hyperventilatory response to CO_2 sets in at concentrations considerably higher than 2% (up to 12%). The test has also found application in aviation medicine, where hypoexcitability to CO_2 (up to concentrations of 10%) has been correlated with abnormal lack of physical resistance to altitudes (altitude hypocapnia). Inclusion of the test in routine selective physical examinations of pilots, as well as in later physical check-ups, is recommended.

Tabusse, L., 1952c
R. Damasio, and R. Jolly
[ELECTROENCEPHALOGRAPHIC MODIFICATIONS DURING ANOXEMIA AND VARIATIONS UNDER THE INFLUENCE OF CERTAIN SUBSTANCES] Modifications électro-encéphalographiques au cours de l'anoxémie et variations sous l'influence de certaines substances. — Journal de physiologie (Paris), 44 (2): 331-333. 1952. In French. DSG

Essentially the same as the paper, Tabusse, L., 1952a.

Tabusse, L. see also Damasio, R., 1952
Tagliamonte, B. see Lalli, G., 1952

Talbot, J. M. 1952
THE BIOLOGICAL EFFECTS OF POWER PLANT RADIATION. — In: Physics and medicine in the upper atmosphere: a study of the aeropause, p. 540-543. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico Press, 1952. DLC (RC1050.U5, 1952)

The practicability of atom-powered flight is greatly curtailed by the necessity to provide for adequate shielding against nuclear radiation. The author outlines briefly the principal physiological, technical, and medical problems that have to be solved before the atomic aircraft will become a reality.

Taylor, C. L. 1952
HUMAN TOLERANCE FOR TEMPERATURE EXTREMES. — In: Physics and medicine of the upper atmosphere: a study of the aeropause, p. 548-561. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico Press, 1952. DLC (RC1050.U5, 1952)

Pressurization and air conditioning of airplane cabins have, within the present range of operations, limited the problems concerning human tolerance of extreme temperatures to incidences of cabin failure. In ultrasonic flight, however, air friction of the fuselage produces surface temperatures which surpass human tolerance (thus, the temperature in a plane flying at a speed of 800 m.p.h., at an outside temperature of 37.7°C.

and at a low altitude, would reach 101.5° C.). Waist gunners of the U. S. Air Force wearing heavy clothing with supplementary electrical heating, have withstood environmental air temperatures of -40° C. A pilot provided with heavy clothing is able to withstand temperatures up to -5° C. in his normal resting position, and up to -40° C. when doing work equivalent to walking at a speed of 2.5 m.p.h. The author reviews briefly the basic principles involved in body heat exchange, body evaporation, time tolerance at extreme heat and cold exposures, and the effects of exercise.

Terneau see Achiary, 1952

Terzioğlu, M. N., 1952
F. Özer, and A. Songar
STUDIES IN BLOOD PHYSIOLOGY AT MID-ALTITUDE. I. VARIATIONS IN BLOOD MORPHOLOGY AT ULADAĞ (1850 m.). — Archives internationales de physiologie (Paris), 60 (3): 233-252. 1952. In English. DSG

The progress of erythropoiesis and related processes was observed on 11 subjects over the period of 10 days at Uladağ (Turkey) (elevation 1850 m., atmospheric pressure 610-617 mm. Hg). The erythrocyte count increased 10.9% and the hemoglobin concentration 8.6% within 10 days. Only very slight deviations of the blood color index from normal were observed. The percentage of total red cell volume rose during the first 3 days. The erythrocyte diameter decreased initially, but returned to normal at the end of the 10-day period. At the beginning, the resistance of the erythrocytes to hypotonic solutions was below normal; the resistance increased, however, after a few days of altitude exposure. Upon return to sea level, hemoglobin concentration, hematocrit value, and corpuscular volume returned to normal within 8-10 days, while the mean corpuscular surface area remained high. The osmotic resistance of the erythrocytes increased still further. The physiological mechanism of the observed changes is discussed.

Terzioğlu, M. N. 1952a
N. Peköz, and F. Özer
STUDIES IN BLOOD PHYSIOLOGY AT MID-ALTITUDE. II. THE GASEOUS CONTENT AND ACID-BASE EQUILIBRIUM OF BLOOD AT ULADAĞ (1850 m.). — Archives internationales de physiologie (Paris), 60 (3): 252-265. 1952. In English. DSG

O_2 and CO_2 contents, O_2 capacity, alkali reserve, and pH values of venous blood were measured on 2 female and 8 male students during a 10-day stay at Uladağ (Turkey) (1850 m. altitude). The venous O_2 content decreased 32.3% within 10 days, while the O_2 capacity remained unchanged. There was a marked decrease in the O_2 saturation of venous blood while erythropoietic changes were in progress, a fact that suggests a correlation between erythropoiesis and anoxemia. The blood pH remained unaltered, but the alkali reserve decreased from the very beginning of the stay. All values returned to normal within 8-10 days after return to sea level. A physiological interpretation of the data is attempted.

Terzioğlu, M., 1952b
N. Peköz, and F. Özer
[OBSERVATIONS ON HEMATOLOGICAL CHANGES AT MID-ALTITUDES]. Orta irtifalarda müşachede edilen hematolojik değişiklikler. — Tip fakültesi mecmuasi (Istanbul), 15 (2): 799-819. In Turkish, with English summary (p. 817-818). DSG (W1 IS784, v. 15)

The effects of altitude on erythropoiesis and on accompanying hematological variations were investigated on a group of medical students during three excursions to Uludağ (1850 m., 610-617 mm. Hg). The number of erythrocytes and the hemoglobin concentration increased during a stay of 11-13 days. Values returned to normal 7-12 days after descent to sea level. During the first 3 days at Uludağ, the hematocrit value and the corpuscular volume increased to a marked degree, while the erythrocyte diameter decreased (returning to normal after 10 days). The osmotic resistance of erythrocytes toward hypotonic solutions decreased during the first three days of altitude exposure, then increased from the fourth to the tenth day and still further augmented 7-10 days after return to sea level. The O_2 capacity of the blood (as determined by Winterstein's micro-blood gas analysis) increased, while the venous O_2 content was markedly reduced (32.3%). The pH of the blood remained constant while the alkali reserve was reduced, a fact that indicated a compensatory process to maintain the acid-base equilibrium. A brief discussion of the physiological mechanisms is presented.

Thetford, P. E. 1952
and F. E. Guedry
JUDGMENT OF THE POSTURAL VERTICAL DURING EXPOSURE TO A MISLEADING VISUAL FRAMEWORK IN UNILATERALLY LABYRINTHECTOMIZED SUBJECTS. — July 28, 1952. 6 p. Tulane Univ., New Orleans, La. (Contract N7onr-434, Task order 1); and Naval School of Aviation Medicine, Pensacola, Fla. (Project report no. NM 001 063.01.27), Joint project report no. 27 (TIP U24237).
UNCLASSIFIED

Four unilaterally labyrinthectomized women attempted to attain postural vertical by manipulating their tilt chairs from an angle of 20° to the right or to the left of vertical. The room remained vertical or was tilted 30° to the right or to the left. In general, the estimated verticals were not displaced in the direction of the injured side and the tilted framework did not have unusual effects on the women's judgments. Subjects with one functional labyrinth did not demonstrate a less accurate judgment of verticality than normal persons. (TIP abstract)

Thompson, L. N. 1952
MAN WITHOUT GRAVITY: THE PHYSIOLOGICAL AND PSYCHOLOGICAL PROBLEMS OF

SPACE FLIGHT. — Flight (London), 61: 298-300. March 14, 1952.
DLC (TL501. F5, v. 61)

The principal physiological functions of the human body, such as respiration, circulation, and digestion, are primarily muscular in action and therefore independent of gravitational pull. The action of the labyrinthic fluid in the inner ear is determined by mass inertia rather than by weight. The otolith organs on the other hand require a gravitational field for their normal operation. However, it is not known what nervous impulses would be transmitted by the otolithic organs under true zero g conditions; experimental evidence allows the assumption that vision and somatic sense organs would partly compensate for disturbances in the balancing mechanism of the inner ear. — The author summarizes other problems that will arise in actual space flight, such as the need for atmospheric circulation because of lack of convection currents, prevention of blackouts during high take-off accelerations, protection from radiation, the possibility of infection by alien viruses and germs encountered on other planets, and the need of proper preparation against psychological crises on extended flights.

Thompson, M. E. 1952
A STUDY OF RELIABILITIES OF SELECTED GROSS MUSCULAR COORDINATION TEST ITEMS. — October 1952. v+11p. University of Arkansas, Fayetteville (Contract AF 33(038)-22948); issued by Air Training Command. Human Resources Research Center. Perceptual and Motor Skills Research Lab., Lackland Air Force Base, Tex. Research bulletin no. 52-29 (Project no. 509-020-0005) (TIP U25803). UNCLASSIFIED

A number of gross-muscular-coordination tests, which utilized simple apparatus and could be scored on a pass-fail basis, were administered to at least 100 college students. The subjects took each test item twice in succession. The reliability coefficients for the test items ranged from 0.16 to 0.95, with 56% at or above 0.60. A larger percentage (91)% of the items were easier on the second trial; only 9% showed the effect of fatigue. (TIP abstract)

Thorndike, R. L. 1952
and R. C. Norris
EMPIRICAL EVIDENCE ON AIR FORCE CAREER FIELDS. — March 1952. v+14 p. Columbia Univ. Teachers Coll., New York (Contract AF 33(038)-13474); issued by Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research Bull. no. 52-13 (Project no. 510-022-0001) (TIP U22500). PB 107021

Statistical analyses of two sets of job classification data were compared, the analyses being based on the assumption that all the variance common to the criterion variable and the predictors is the common-factor variance represented by the factors extracted in the factor analysis of predictor variables. The two sets of data contained 31 and 29 sets of validity coefficients, respectively, representing Air Force training course assignments grouped into 6 or 7 main career clusters. The analyses indicated that there was little basis for differentiation of career clusters by the use of training-school grades. Possible reasons suggested for this were: (1) the analyses were faulty, (2) the battery of predictor variables was inadequate, (3) the train training-school criterion may have given an unsatisfactory measure of job success, or (4) there may be no more clustering of Air Force jobs than is indicated by the results. (TIP abstract)

Thorndike, R. L. 1952a
and E. Hagen
AN EXPLORATORY SURVEY OF CIVILIAN EXPERIENCE RELATED TO MILITARY JOBS. — June 1952. v+14 p. Columbia Univ. Teachers Coll., New York (Contract AF 33(038)-13474); issued by Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research Bull. no. 52-20 (Project no. 510-022-0001) (TIP U24102). PB 107461

The Experience Record, a questionnaire, was used to survey in the civilian population the types of vocational experiences related to military jobs. This survey covered three groups: (1) 1772 males drawn from 4 localities, (2) several subgroups, each composed of men employed in a specific field of work, and (3) airmen at Lackland Air Force Base. The results indicated the feasibility of using a work skill survey. There appeared to be differences in work experience attributable to age and geographical variations. The results obtained from the small subgroups gave an indication of the test's validity. (TIP abstract)

Tiedeman, D. V., 1952
J. G. Bryan, and P. J. Rulon
APPLICATION OF THE MULTIPLE DISCRIMINANT FUNCTION TO DATA FROM THE AIRMAN CLASSIFICATION BATTERY. — Dec. 1952. vi+55 p. Educational Research Corp., Cambridge, Mass. (Contract AF 33(038)-14129); issued by Air Training Command. Human Resources Research Center. Personnel Research Lab., Lackland Air Force Base, Tex. Research bulletin no. 52-37. (Project no. 503-001-0016) (AD 6211). PB 109066

A new approach to the selection and classification of AF Trainees is described. The new procedure, which is directed primarily toward the establishment of differences in abilities required for various jobs, utilizes the multiple discriminant function. The study involved 6105 airmen who had satisfactorily completed training in one of eight specialties and had also completed all the tests of the Airman Classification Battery AC-1. Multiple discriminant analysis of these dat revealed that essentially all the information concerning the separation of the 8-specialty centroids in the 17-dimensional Airman Classification Battery space is described by two linear

combinations of the 17 variates. These two functions are believed to represent mechanical ability and intellectual ability. A study of the distributions of two discriminant scores, computed for each airman, showed that the assumption of bivariate normality was tenable for the discriminant score distributions with but one exception. "Centour" scores were computed for each group under the assumption of a normal bivariate discriminant score distribution. These scores would be helpful for career guidance of new airmen except for the large overlap of the 8 groups in the Airman Classification Battery space. (TIP abstract)

Tinkham, M. F. see Strickland, B. A., 1952a

Tobias, C. A. 1952
RADIATION HAZARDS IN HIGH ALTITUDE AVIATION. — Jour. Aviation Med., 23 (4): 345-372. 1952. DLC (TL555.A1A4, v. 23)

This is a comprehensive review of the problem of biological effects of cosmic radiation (with a bibliography of 70 items). The topics discussed are: distribution of various types of radiations in cosmic radiation; neutrons in the atmosphere; ionization from cosmic-ray nuclei; frequency and distribution of cosmic-ray primaries in the atmosphere; energy transfer from cosmic-ray nuclei; estimate of the dose of cosmic radiation; evaluation of biological effects of light and heavy nuclei in cosmic rays; amount of destruction along the tracks of heavy nuclei; various special effects (on life span, carcinogenesis, on fertility, genetic effects, effects on nerve tissues, radiation cataracts); and suggestions for experimental tests of the biological effects of cosmic rays.

Tobias, C. A., 1952a
RADIATION HAZARDS IN HIGH ALTITUDE AVIATION. — May 1952. vii+36 p. California Univ. Donner Lab., Berkeley; issued by Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. WADC Technical report no. 52-119 (RDO no. 695-72) (AD 5). UNCLASSIFIED

Essentially the same as the paper, Tobias, C. A., 1952.

Tonndorf, J. 1952
and F. A. Brogan
PROCEDURES IN NOISE AUDIOMETRY. — School of Aviation Medicine, Randolph Field, Tex. March 1952. iii+10 p. (Project no. 21-27-001, Report no. 3; TIP U22010). UNCLASSIFIED

An audiometric testing procedure was investigated, and a threshold curve from normal subjects was developed to be used as a standard for testing partially deaf persons. Normal subjects were tested for their ability to detect pure-tone signals for 5 frequencies from 250 to 4000 c.p.s. in the presence of calibrated white noise ranging from 0 to 103 db. Their ability to comprehend spondaic words or words from a PB word list (phonetically balanced monosyllables) against the same range of background noise was then determined. The results were plotted as signal intensity (based on 50% word comprehension) versus noise intensity. Percent-articulation scores were determined with signal intensities 25 db. above those required for the subject's 50%-intelligibility score at each noise level (50% intelligibility corresponded to 8% articulation when both were presented at equal signal intensity). The difference between 50% intelligibility and 50% articulation in terms of loudness sensation was equal at the high masking levels only. Audiometry tests, when conducted in the presence of noise, minimize the disadvantages of extra-auditory functions, such as education and intelligence, which are associated with hearing tests that rely on the recognition of speech signals. (TIP abstract)

Tonndorf, J. 1952a
and F. A. Brogan
COCHLEAR MICROPHONICS FOLLOWING NOISE EXPOSURE. — School of Aviation Medicine, Randolph Field, Tex. July 1952. iii+10 p. (Project no. 21-27-001, Report no. 7; TIP U23362). PB 107224

Cochlear microphonics were measured in guinea pigs before, during, and after exposure to white noise of 130 db. intensity and 30 minutes' duration or to an equal amount of a line-spectrum noise (300-cycle square wave). The results were differentiated as to changes in both the AC and the DC potentials. Both forms of change appeared to be more severe and recovered to a lesser degree in the animals of the white-noise group than in those of the line-spectrum group. These results are explained by the fact that overload, normally apparent in gradient curves of cochlear microphonics in response to short presentation of intense pure tones, increases with the spectral density of the test signal. Parallel findings in the incidence and degree of hearing losses in aircraft maintenance workers on both jet and conventional aircraft (Guild) suggest that the reported observations of changes in cochlear microphonics are indicative of actual cochlear injury resulting from exposure to both types of noise. (Authors' summary)

Tonndorf, J. 1952b
and F. A. Brogan
TWO FORMS OF CHANGE IN COCHLEAR MICROPHONICS; PARALLEL SHIFT IN STIMULUS INTENSITY AND TRUNCATION OF GRADIENT CURVES. — School of Aviation Medicine, Randolph Field, Tex. July 1952. iii+13p. (Project no. 21-27-001, report no. 6; TIP U23361). PB 107223

A theory concerning changes in cochlear microphonics resulting from traumatization of the ear was postulated from rapidly recorded gradient curves of the microphonics when the ear was exposed to either high intensity sound, or diisopropyl fluorophosphate (DFP) or sodium azide (NaN_3) poisoning. Changes in the gradient curves were represented by a parallel shift in stimulus intensity and by truncation, the former representing a loss of the a.c. potential attributable to ionization processes within the organ. The two forms of change were independent of each other. Changes in a.c. and d.c. potentials in the ear as a result of injury are regarded as indicative of combined structural and cytochemical damages which may or may not be reversible. (TIP abstract)

Tonndorf, J. 1952c
AUDITORY EFFICIENCY OF THE HARD-OF-HEARING IN NOISE. — School of Aviation Medicine, Randolph Field, Tex. Sep. 1952. iii+17 p. (Project no. 21-27-001, Report no. 8; AD 1105). PB 108390

Audiometric tests in quiet and at several levels of calibrated white noise were completed on 66 subjects with unilateral or bilateral hearing losses. The Social Adequacy Index for Hearing (SAI), derived from the speech threshold and maximum articulation level, was used as an indication of the hearing efficiency in deafened subjects. The change of the SAI with noise indicated the change in hearing efficiency induced by noise did not always follow the pattern established for the normal ear. This could not be predicted from audiometric tests taken in quiet. The relative impairment with regard to the pure-tone perception, expressed by a ratio between the speech loss and pure tones, was thought to express the effect of extra-auditory factors which might affect speech perception. (AD abstract)

Trumbull, R. 1952
ANALYSIS OF BASIC FACTORS CONSTITUTING NECESSARY MATHEMATICAL PROFICIENCY REQUIRED FOR SUCCESS IN NAVAL AVIATION: REPORT I. ADDITION. — Naval School of Aviation Medicine, Pensacola, Fla. July 1, 1952. 13+5 p. (Project report no. NM 001 058.20.01; TIP U24239). UNCLASSIFIED

A test containing 54 addition items was constructed in which each item required the adding of two 3-digit numbers; the various digits were presented in a representative sample of the possible positions and combinations. The items formed one section of an arithmetic test given to 331 cadets during their indoctrination week. An analysis of errors in terms of digit and position involvement showed that these variables contribute significantly to error causation. Distinct levels of difficulty existed among various digit combinations. The first operation performed in 3-digit summing was significantly easier than subsequent operations. Consistent sources of error appeared. Item count and process analysis were considered to provide means for construction of addition items of greater discriminative value for selection testing purposes. A brief experimental trial demonstrated that short tests composed of previously established discriminative items may be used without sacrificing the error potential of the items. (TIP abstract)

Trumbull, R. 1952a
ANALYSIS OF BASIC FACTORS CONSTITUTING NECESSARY MATHEMATICAL PROFICIENCY REQUIRED FOR SUCCESS IN NAVAL AVIATION. REPORT II. SUBTRACTION. — Naval School of Aviation Medicine, Pensacola, Fla. Nov. 1, 1952. 12+10 p. (Project report no. NM 001 058.20.02; AD 2520). UNCLASSIFIED

This study of subtraction is the second in a series of analyses of basic arithmetical proficiency of Naval Aviation Cadets. This series is designed to evaluate the methods of doing problems and types of errors found in Naval Aviation Cadet computations. These data will be used for future selection test construction with predictable control of difficulty and discrimination. The present study analyzes errors may be 331 Naval Aviation Cadets on a subtraction test of 54 items. These errors were employed in the construction of an experimental form composed of selected items of established difficulty and new items synthesized from selected processes of established difficulty. Through analysis of the results, the relative reliability of these two methods of test construction was ascertained. (Author's summary)

Tryon, G. H. 1952
AIRCRAFT CRASH RESCUE PROBLEMS. — National Fire Protection Association, Boston, Mass. NFPA Aviation bulletin no. 82, April 24, 1952. 16 p.

Rescue opportunities normally depend on how the aircraft design influences chances of occupant survival, the severity of the impact forces and whether or not fire control or extinguishment can be secured before flames or radiant heat fatally affect occupants. The most frightening thing about the usual severe crash fire is the ignition of the fuel vapor "aerosol" (mist) created by the impact release of the fuel. This initial fierce "aerosol" fire appears awesome but rarely presents any real hazard to the occupants except wherein it spreads flame to all leaking fuel sources. After this first "flash fire," the dangerous flame impingement to the fuselage occurs. It is this "secondary" fire which must be extinguished or controlled. Occupant survivability depends heavily on the ability of the fire fighter to "knock down" the bulk of the flame impingement on the fuselage. The "combined agent" technique of fire fighting using carbon dioxide and foam in large quantities and at rapid discharge rates offers the best chance of securing control up to the present time. Heat radiation appears to be the most critical factor in occupant survivability. Maintaining the integrity of the fuselage as a radiant shield is essential if persons are trapped within an aircraft and fire is exterior. A protective heat-absorbing water-spray or foam is essential under such conditions. Response times are critical. (From the author's summary)

Tucci, E. A. 1952
and P. B. Ruchelli
[MODIFICATIONS OF ARTERIAL PRESSURE IN RELATION TO FLIGHT] Modificaciones de la presión arterial en relación con el vuelo. — Medicina del deporte y del trabajo (Buenos Aires), 16 (108): 4686-4691. 1952. In Spanish. DSG (W1 RE4225, v. 16)

Three hundred military pilots and 84 navigators, all under 35 years of age, were divided into 3 groups. Group I, with 200-600 flight hours experience, had a stable arterial pressure, with a slight tendency to an increase; the minimum pressure varied in proportion to the maximum values.

In Group II, with 600-1500 flight hours, a progressive lowering of arterial pressure was seen, which amounted to 5 mm. Hg at the most. In Group III, flying personnel over 1500 flight hours, the mean pressure values were further decreased by a small amount.

(Tufts Exper. Psychol.) 1952
HANDBOOK OF HUMAN ENGINEERING DATA. — 2nd ed., Nov. 1, 1952. 243 p. Tufts Coll. Inst. for Applied Experimental Psychology, Medford, Mass. (Contract N6ori-199, Task order 1); issued by Office of Naval Research. Special Devices Center, Washington, D. C. Human Engineering Report no. SDC 199-1-2a (Project no. NR 783-001, Human Engineering Project 20-G-1) (AD 43 650). UNCLASSIFIED

This is supplement no. 2 to the original Handbook of Human Engineering Data, published in 1949, in which the entire field of human engineering was surveyed. The supplement represents a complete revision and expansion of Part VI of the Handbook dealing with the subject of Motor Performance. The arrangement is as follows: (1) basic concepts; (2) biological characteristics of motor performance (speed, accuracy, force, and individual differences); (3) task and job characteristics (nature of equipment, use of the body, display-control relations, scheduling of work, motivation, and environmental factors); and (4) efficient work arrangement. Extensive bibliographies are attached to each major section.

Tupes, E. C. 1952
THE RELATIONSHIP BETWEEN SCORES ON THE GUILFORD MARTIN PERSONALITY INVENTORY AND SUCCESS IN USAF OFFICER CANDIDATE SCHOOL. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research Note no. PERS 52-57, Dec. 1952. 3 p. (Project no. 503-002-0007; AD 3228). UNCLASSIFIED

Three inventory tests were administered to USAF Officer Candidate School class 49B just prior to graduation with instructions designed to simulate an actual selection situation, and to class 50C during the second week of training with instructions designed to evoke honest responses. None of the inventory scores had sufficient validity against any criterion for either class to be of practical value. Intercorrelations indicated a slight negative relationship between rhathymia (an impulsive "happy-go-lucky" attitude) and school success, and a slight positive relationship between cooperativeness and school success. (AD abstract)

Tupes, E. C. 1952a
THE VALIDITY OF COMMERCIAL INTEREST INVENTORIES FOR PREDICTION OF SUCCESS IN USAF OFFICER CANDIDATE SCHOOL. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. PERS 52-50, Dec. 1952. 6 p. (Project no. 503-002-0007; AD 8097). UNCLASSIFIED

No significant relations were established by correlating the scores of four commercial-interest inventories with the following Officer Candidate School success criteria: academic grades, buddy ratings, military grades, and over-all grades. The inventories administered were: (1) the Strong Vocational Interest Blank for Men, form MM; (2) the Kuder Preference Record, form BM; (3) the Guilford-Schneidman-Zimmerman Interest Survey; and (4) the Allport-Vernon Study of Values. (AD abstract)

Tupes, E. C. 1952b
VALIDITY OF THE COOPERATIVE GENERAL CULTURE TEST, FORM Y, FOR PREDICTION OF INAL GRADES IN USAF OFFICER CANDIDATE SCHOOL. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. PERS 52-55, Dec. 1952. 7 p. (Project no. 503-002-0007; AD 7856). UNCLASSIFIED

The relationships between the six Form-Y subtests of the Cooperative General Culture Test (CGCT), the years of college attended, and the final military, academic, and over-all Officer Candidate School (OCS) grades were determined for OCS classes 51-C, 51-D, 52-A, and 52-B. Each of the subtests in significantly related to the final academic grades (median value of 0.58) and the final over-all grades (0.41) of all classes. The validities are lower on military grades (0.14), which are based on peer and staff leadership ratings, although that of mathematics is significant for all classes. The number of years in college has little relation to the OCS academic grade criterion. A composite of CGCT scores served as a measure of the subject's college achievement for the CGCT test areas. (AD abstract)

Tupes, E. C. 1952c
VALIDITY OF GUILDORD REASONING TEST FOR PREDICTION OF GRADES IN USAF OFFICER CANDIDATE SCHOOL. — Sheridan Supply Co., Los Angeles, Calif. (Contract 50-4304P); issued by Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. PERS 52-56, Dec. 1952. 2 p. (Project no. 503-002-0007; AD 3229). UNCLASSIFIED

The correlations between 32 reasoning tests and four USAF Officer Candidate School criteria for a sample of 114 graduates are tabulated. The majority of the test variables correlate significantly with academic grades; seven are significantly related to military grades. (AD abstract)

Tupes, E. C. 1952d
and E. C. McClanahan
THE RELATIONSHIP OF AGE AND EDUCATION TO SUCCESS IN USAF OFFICER CANDIDATE SCHOOL. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. PERS 52-58, Dec. 1952. 13 p. (Project no. 503-002-0007; AD 3224). UNCLASSIFIED

Correlations between age and education on the one hand and graduation or elimination from Officer Candidate School on the other indicated that education was not related to success, while age was negatively related. The older candidates had slightly more difficulty in meeting graduation requirements than did the younger men. There was a slight positive relationship between age and military ratings, and there were small negative relationships between age and academic grades and between education and military ratings. (AD abstract)

Tupes, E. C. 1952e
and J. K. Yarnold
MILITARY ATTITUDE AS A PREDICTOR OF AIR FORCE SUCCESS; PRELIMINARY STUDIES OF THE ATTITUDE SURVEY. — Air Training Command. Human Resources Research Center. Personnel Research Lab., Lackland Air Force Base, Tex. Research bulletin no. 52-23, July 1952. vi+21 p. (Project no. 503-002-0007; ATI 169 019). PB 107726

This bulletin describes the development of the Attitude Survey as an instrument to measure military attitude and presents a series of short studies demonstrating relationships between "morale" and several criteria of military success in samples from several military populations. When these studies are considered in toto, the following conclusions may be drawn: (1) When individuals are questioned concerning their attitudes toward various aspects of the military service, their responses, obtained under experimental testing conditions, may be scored to yield a reasonably homogeneous and reliable measure of the favorableness or unfavorableness of their general attitude toward military service. (2) Attitude toward military service is related positively to successful completion of Air Force training schools. (3) Tentatively, attitude toward military service does not appear to be related to overt observable personality characteristics or reflected in trait ratings by peers. (4) The Attitude Survey, in its present form, is probably of little value as a selection device but appears to be a useful instrument for the experimental study of military attitude. (From authors' summary)

Tye, W. 1952
MODERN TRENDS IN CIVIL AIRWORTHINESS REQUIREMENTS. — Jour. Roy. Aeronaut. Soc. (London), 56 (494): 73-96; discussion, p. 96-108. 1952. DCAA

Technical and physiological aspects of aviation safety are reviewed. Statistics of aviation accident rates in Great Britain and the U. S. are presented, covering the years 1940 to 1950. An analysis of accident causes revealed that pilot errors account for relatively few accidents. It is recommended, however, that controls be simplified and a greater accuracy of landing instrumentation be developed. Recent trends in airplane design, structure, and performance are discussed from the viewpoint of safety. Among design features contributing toward making the airplane safe in the event of crash, the following are suggested: (1) introduction of backward-facing seats, more widely spaced forward-facing seats, or of alternately back- and forward-facing seats; (2) providing seats, belts, and floor structure offering 20 g protection in the aft, and 10 g protection in the forward compartment; (3) concentration of the greater number of passengers in the rear of the cabin; (4) padding of all objects in the path of potential forward thrust of the passenger; and (5) increasing the impact strength of fuel tanks and removing the tanks as far as possible from sources of ignition (the use of wingtip tanks should be further investigated).

Ulett, G. A. 1952
G. [C.] Gleser, A. Lawler, and G. Winokur
PSYCHIATRIC SCREENING OF FLYING PERSONNEL. IV. AN EXPERIMENTAL INVESTIGATION OF DEVELOPMENT OF AN EEG INDEX OF ANXIETY TOLERANCE BY MEANS OF PHOTIC STIMULATION: ITS VALIDATION BY PSYCHOLOGICAL AND PSYCHIATRIC CRITERIA. — August 1952. iii+39 p. Washington Univ. School of Medicine, St. Louis, Mo. (Contract AF 33(038)13884); issued by School of Aviation Medicine, Randolph Field, Tex. (Project no. 21-37-002, Report no. 4) (TIP U23925). PB 107351

EEG response to intermittent photic stimulation was studied in 221 subjects classified as to anxiety-proneness by psychiatric and psychological screening. Significant correlations exist between anxiety-proneness and (a) flicker-induced subjective dysphoria; (b) upper harmonic EEG response to selected flicker frequencies; (c) shift of driving centroid from normal range; (d) the proportion of abnormal and low alpha resting EEG records. Combining an experimental stress situation with prolonged photic stimulation produced changes in the EEG response but did not select anxiety-prone individuals. (School of Aviation Medicine abstract)

Underwood, B. J. see Duncan, C. P., 1952
Underwood, G. B. see Gaul, L. E., 1952

Vacca, C. 1952
[THE TIME OF RESTORATION OF MUSCLE CONTRACTION IN CONDITIONS OF HYPOXIA] Il tempo di ripristino della contrazione muscolare in condizioni di ipossia. — Rivista di medicina aeronautica (Roma), 15 (3): 376-387. 1952. In Italian, with English, French, Spanish, and German summaries (p. 384-386). DSG

Healthy male subjects were given a weight-lifting test (3-5 kg. lifted 3 cm. higher per second by the second phalanx of the middle finger of the right hand) in a decompression chamber. The experiments were carried out first at ground level, then at simulated altitudes of 3500 m., 4500 m., and 5500 m. According to the myographic fatigue curve, the same time was required to induce fatigue and to restore the muscle contraction at sea level as well as at altitude. Chemical variations of the blood were analyzed at all four altitude levels. The pyruvic acid concentration had a tendency to decrease at higher altitude, especially under the influence of work. Lacticemia at rest

in anoxia did not show high values but increased after muscular fatigue and persisted even after restoration of muscular contraction. Oxygen breathing decreased the lactic acid content of the blood but increased slightly the pyruvic acid level.

Vail, E. G. 1952
FORCES PRODUCED IN THE THORAX BY EXPLOSIVE DECOMPRESSION. — Jour. Aviation Med., 23 (6): 577-583. DLC (TL555.A1A4, v. 23)

Anesthetized dogs were subjected to a series of explosive decompressions; intrapleural, lateral tracheal, and intraabdominal pressures as well as carotid blood pressure were recorded simultaneously. — "1. Intrathoracic pressures capable of producing pulmonary damage in dogs have been described under conditions of explosive decompression. This damage takes the form of petechial hemorrhages and areas of atelectasis visible over the surface of the lungs. — 2. The probable mechanism of pulmonary damage is attributed to suddenly applied thrust and shear forces which occur during extremely rapid expansion of the lungs. The magnitude of pulmonary injury is dependent upon the rapidity with which the damaging forces are applied, the degree to which the lungs expand, and the level of instantaneous intrapulmonary pressures which exist during the explosive decompression. — 3. Further evidence for the existence of 'vapothorax' in unprotected animals has been presented." (Author's summary.)

Vail, E. G., 1952a
W. E. Hull, and K. W. Gillespie
FORCES PRODUCED IN THE THORAX BY EXPLOSIVE DECOMPRESSION. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. Technical note no. WCRD 52-54, Sept. 1952. 10 p. (RDO no. 696-77; AD 10 201). UNCLASSIFIED

Same as the paper, Vail, E. G., 1952.

Vail, E. G. 1952b
TOLERANCE OF INDIVIDUALS TO THE USE OF CAPSTAN "READY-PRESSURE" WHILE WEARING THE T-1 ALTITUDE SUIT. — Wright Air Development Center. Aero Medical Lab., Wright-Patterson Air Force Base, Ohio. Technical note WCRD 52-34, Sept. 1952. 5 p. (RDO no. 696-77; AD 63-106). UNCLASSIFIED

"Capstan ready pressure" is defined as the maintenance of an optimal gas pressure in the capstans (air ducts) of the T-1 altitude suit, which expand on decompression to provide the individual with moderate counterpressure. Experiments were carried out with various initial capstan pressures (10 to 50 mm. Hg) at different altitudes (ground level to 40,000 feet), recording the resultant pressures in the capstan tubes at 5000-foot intervals. The following conclusions were reached: (1) while capstan "ready pressure" was not found comfortable, it was considered tolerable for 6 hours during ground-level tests and during flight tests in explosively decompressed aircraft cabins; and (2) the T-1 altitude suit with capstan "ready-pressure" seems to contribute structural support to posture in the sitting position of bomber pilots while flying.

Vail, E. G. see also Burch, B. H., 1952

Van Allen, J. A. 1952
THE NATURE AND INTENSITY OF THE COSMIC RADIATION. — In: Physics and medicine of the upper atmosphere: a study of the aeropause, p. 239-266. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico Press, 1952. DLC (RC1050.U5, 1952)

The nature and intensity of primary cosmic radiation in relation to altitude and geomagnetic latitude are reviewed. Contrary to previous findings based on experiments with photographic emulsions, the author denies the seriousness of radiation hazards to biological tissues which consist mainly of lighter, and thereby less reactive, elements. Cosmic-ray bursts may be expected to produce, under the most extreme conditions, the same biological effects as would a uniform concentration of 0.5×10^{-12} gram of radium per gram of biological tissue throughout the body (with heavier concentrations in the bones). Hazards below 60,000 ft. altitude are negligible and are further reduced near the geomagnetic equator (i.e., in the tropical zone). Considerable further research is required, however, before a final evaluation may be reached.

Vanderwater, D. K. see Neely, K. K., 1952

Van Liere, E. J., 1952
G. B. McCarty, and J. G. Matthews
EFFECT OF HYPOXIA AND ANEMIC ANOXIA ON UTERUS. — Amer. Jour. Physiol., 171 (1): 245-249. 1952. DLC (QP1.A5, v. 171)

Eighteen female dogs were exposed to breathing of mixtures of nitrogen and 5, 6, or 9% oxygen. Four of the dogs were pregnant, one was in estrus, and the remainder were estrogenized to increase uterus activity. No noteworthy change in uterus contractions was observed during the stages of hypoxia. For comparison, anemic anoxia was produced by bleeding (1.5% and 0.5% of body weight), and it was found that uterine contractions were enhanced considerably. This is attributed to stimulation of the sympathetic innervation of the uterine muscles.

Van Liere, E. J. 1952a
ANOXIA: ITS EFFECT ON THE BODY. — xiii+269 p. Chicago: Univ. of Chicago Press, 1952. DLC (QP177.V35)

This is a comprehensive review of the physiological effects of anoxia from both the theoretical and applied points of view. Introductory chapters deal with the history of anoxia studies and with the classification of the various phenomena included under "anoxia". The effects of anoxia on the blood, on the heart and circulation, blood

pressure, respiration, endocrine glands, alimentary tract, on the excretion of urine, metabolism, temperature regulation, and on the nervous system are analyzed in detail. Of special interest are the chapters discussing the subjective and objective symptoms experienced during high-altitude flights, and the various phases and physiological factors involved in altitude acclimatization. Each chapter is followed by an extensive bibliography: the detailed index is very valuable.

Vawter, G. F. see Brown, Arnould L., 1952, 1952a; Marbarger, J. P., 1952

Vellard, J. 1952
[PHYSICAL ANTHROPOLOGY OF MAN OF THE HIGH PLATEAU] Antropología física del hombre del altiplano. — Annales de la facultad de medicina, Universidad nacional mayor de San Marcos de Lima (Lima, Peru), 35 (1): 70-110. 1952. In Spanish. DSG

A comprehensive description of the physical and racial characteristics and a tabulation of body measurements of the natives of the Bolivian Plateau and the vicinity of Lake Titicaca is presented. Anthropological data and measurements of inhabitants of the lower regions are given for comparison.

Vellard, J. 1952a
[CHARACTERISTICS OF ADAPTATION TO LIFE IN THE HIGH ALTITUDES OF THE ANDES]. Carácteres adaptivos a la vida en las altas regiones andinas. — Anales de la facultad de medicina, Universidad nacional mayor de San Marcos de Lima (Lima, Peru), 35 (1): 189-192. 1952. In Spanish. DSG

Average body measurements of racial groups inhabiting the Andes plateau (4000 m. elevation and above) reveal a uniformly represented exceptional three-dimensional development of the thorax. The measurements (waistline, anterior-posterior thoracic diameter, transversal thoracic diameter, height of the sternum, thoracic circumference, thoracic volume, and thoracic index) are tabulated for 17 racial and regional groups. For reasons of comparison, corresponding measurements are listed from soldiers originating in lower regions, such as Bolivia (3,500 - 4,300 m.), Central Peru (3000 - 4000 m.), and the Peruvian coastal plain.

Venturi, V. M. 1952
[ON THE ACTION OF DRUGS IN HIGH ALTITUDE CLIMATE] Sull' azione dei farmaci nel clima d' altezza. — Rivista di medicina aeronautica (Roma), 15 (3): 436-451. 1952. In Italian. DSG

The combined effects of drugs and hypoxia manifest themselves as synergism or antagonism. At altitude, the action of certain drugs is intensified; this is the case with antimalarial drugs, sulfonamides, antihistaminics, hemopoietic drugs, etc. Other drugs, however, seem to have a reduced effect at altitude, and it is necessary to administer greater doses to achieve a given therapeutic result, e.g., diuretics. These findings open new vistas in research. No definite scheme can be set up concerning the effectiveness of drugs tested at altitudes, as not only quantitative but qualitative factors are to be taken into consideration.

Verplanck, W. S., 1952
G. H. Collier, and J. W. Cotton
NONINDEPENDENCE OF SUCCESSIVE RESPONSES IN MEASUREMENTS OF THE VISUAL THRESHOLD. — Jour. Exper. Psychol., 44 (4): 273-282. 1952. DLC (BF1.J6, v. 44)
Reprint issued also as: Indiana Univ., Bloomington (Contract N6onr-180, Task order 4); and Harvard Univ., Cambridge, Mass. (Contract N5ori-07639); issued by Office of Naval Research, Washington, D. C. (Project no. NR 143-015). (AD 1766). UNCLASSIFIED

Experiments were carried out to investigate the statistical interdependence of responses to successive visual stimuli of near-threshold intensity. Sixteen subjects were exposed to 300 consecutive light flashes per session for four consecutive days. During the first two days, the light flashes were presented automatically at 5-second intervals, the remaining two days the subjects produced the flashes by pressing a key. They were instructed to report each flash when seen. All subjects were dark-adapted at the outset of each session. The frequency of responses was found to be related to the luminance of the flash, and to depend largely on previous responses and additional outside factors. No statistical difference was found between automatic and self-imposed methods of stimulation.

Verzár, F. 1952
[LYMPHOCYTE AND EOSINOPHIL COUNT AT 1800 AND 3450 METERS ALTITUDE] Die Zahl der Lymphocyten und eosinophilen Leukocyten in 1800 und 3450 m Höhe. — Schweizerische medizinische Wochenschrift (Basel), 82 (13): 324-327. Mar. 29, 1952. In German. DSG

A count of leukocytes (lymphocytes and eosinophils) was carried out on two groups of test subjects, prior to a trip from Basel (altitude 280 m.) to St. Moritz (1800 m.) and to the Jungfraujoch (3450 m.), respectively, and after a stay of a few days at these altitudes. In both groups a slight lymphocytosis and eosinophil leukocytosis was observed. The degree of these deviations was found subject to the normal diurnal variations (maximal values at night). A possible correlation of the findings with ACTH effects is discussed.

Verzár, F., 1952a
E. Sailer, and V. Vidovic
CHANGES IN THYROID ACTIVITY AT LOW ATMOSPHERIC PRESSURES AND AT HIGH ALTITUDES, AS TESTED WITH ^{131}I. — Jour. Endocrinol. (Oxford, Cambridge), 8 (4): 308-320. 1952. DSG

Thyroid activity in rats was observed by measuring the uptake of I^{131} over several days. When atmospheric pressure was reduced to 250 and 380 mm. Hg, the uptake of I^{131} decreased for a few days. Below 480 mm. Hg a decrease in body temperature was observed, which was likewise restored to normal within 3-4 days. The physiological mechanism underlying the alteration in thyroid function (relation to adrenocortical activity) and the role of the thyroid in altitude acclimatization are discussed.

Verzár, F. see also Flückiger, E., 1952
Vidovic, V. see Verzár, F., 1952a

Villalonga, J. 1952
and W. Lins
[TREATMENT OF WHOOPING COUGH BY HIGH ALTITUDE FLIGHT IN THE BRAZILIAN AIR FORCE] Tratamento de coqueluche pelo vôo de altitude na Fôrca Aérea Brasiliéra. — Revista médica da aeronáutica (Rio de Janeiro), 4 (1): 95-108. 1952. In Portuguese.
DSG (W1 RE609, v. 4)

The beneficial effects of flights provided by the Brazilian Air Force for children suffering from whooping cough are discussed. Of the 48 children taken on flight tours, 87% recovered completely and 11% showed considerable improvement.

Violette, F. 1952
[CIRCULATORY AND RESPIRATORY EFFECTS OF EXPLOSIVE DECOMPRESSION] Effets circulatoires et respiratoires des décompressions explosives. — Journal de Physiologie (Paris), 44 (2): 345-348. 1952. In French.
DLC (QP1. J7, v. 44)

Dogs were exposed to explosive decompression from a simulated altitude of 9,000 m. to that of 15,000 m. After the decompression the animals were returned to a simulated altitude of 10,000 m. at a rate of 150 m. per second, and finally to ground level at a rate of 30 m. per second. Some dogs were anesthetized. Graphic recordings of physiological effects of decompression in the anesthetized animals showed the following: a thoracic dilatation followed by apnea of short duration; minor cardiac disturbances disappearing with the thoracic symptoms; momentary arterial hypertension coinciding with the explosion, often followed by a brief period of hypotension; little change in venous pressure; and a sudden increase of the blood flow at the moment of decompression. The unanesthetized dogs did not show visible signs of distress. Autopsies performed on dogs killed immediately after decompression revealed occasional pulmonary suffusions but no cardiac damage. In dogs killed a week after exposure, the suffusions were found to be in a state of resorption. The physiological changes observed may be attributed to both mechanical causes and reflex action. (cf. Violette, F., 1952a.)

Violette, F. 1952a
[CARDIOVASCULAR EFFECTS OF CERTAIN EXPLOSIVE DECOMPRESSIONS] Effets cardiovasculaires de certaines décompressions explosives. — Médecine aéronautique (Paris), 7 (4): 489-494. 1952. In French.
DLC (TL555. M394, v. 7)

This paper, dealing with the physiological effects of explosive decompression, contains essentially the same information as the paper, Violette, F., 1952.

Violette, F. see also Grandpierre, R., 1952a, 1952c, 1952i, 1952j; Grognot, P. A., 1952b

Walker, R. Y. see Broussard, I. G., 1952
Walsh, T. E. see Graybiel, A., 1952c

Wang, S. C. 1952
and H. I. Chinn
EMETIC TRIGGER ZONE AND MOTION SICKNESS IN DOGS. — Federation Proceedings, 11 (1I): 400. 1952. DSG

The chemoreceptive trigger zone for emesis, previously localized in the caudal portion of the medulla by Wang and Borison (1950) was ablated operatively in 5 dogs sensitive to swinging motion. The results gave confirmation to the theory that the chemoreceptive zone lies in the pathway of the vestibular reflex producing motion sickness.

Wannemacher, E. P. 1952
[EFFECT OF FLYING ON THE MOUTH ORGANS – WHAT THE DENTIST SHOULD KNOW ABOUT IT] Einflüsse des Fliegens auf die Mundorgane – Was der Zahnarzt davon wissen muss. — Schweizerische Monatsschrift fur Zahnheilkunde (Zürich), 62 (7): 718-721. 1952. In German.
DSG

The following dental disturbances associated with flying are briefly summarized: (1) a syndrome of pain (referred to as "aerodontalgia") in the jaw and ear region, frequently localized in the teeth and mostly perceived during ascent and at high altitudes (it may be caused by acute or chronical pulpitis, new fillings, deep fillings without foundations, secondary cavities under the fillings, and other factors); (2) any cavity or metal filling may cause pain under the influence of cold air; (3) hyperemia of the pulp may lead to pain at higher altitude; (4) fillings may break during rapid ascent; (5) expansion of gases in defective teeth may give rise to great pain; (6) faulty articulation may interfere with the proper functioning of the Eustachian tubes because of muscular tension, and lead to ear disturbances; and (7) apical foci may be held responsible for a number of complaints which previously were interpreted as neurocirculatory disturbances. Aviation personnel should only fly for short periods after having undergone major dental surgery, to avoid re-opening of sutures, bleeding, and hematomata.

Wapner, S. 1952
and H. Werner
EXPERIMENTS ON SENSORY-TONIC FIELD THEORY OF PERCEPTION. V. EFFECT OF BODY STATUS ON THE KINESTHETIC PERCEPTION OF VERTICALITY. — Jour. Exper. Psychol., 44 (2): 126-131. 1952. DSG

A healthy test subject was blindfolded and asked to adjust a pivoted rod to the vertical position by moving the fingers of both hands along the rod. When the head or body of the subject was tilted right, or when the body was accelerated around the vertical axis in the clockwise direction or decelerated from constant counterclockwise rotation, the position of the rod which was subjectively perceived by the subject to be vertical was objectively tilted to the left. From this it is decided that extraneous stimulation and body tilt affect kinesthetic perception of verticality the same as visual perception.

Ward, W. D. see Hirsh, I. J., 1952, 1952a

Warren, C. E., 1952
P. M. Fitts, and J. R. Clark
AN APPARATUS FOR THE STUDY OF THE HUMAN OPERATOR. — Elec. Engineering, 71 (3): 220. 1952. DLC (TK1.A61, v. 71)

This is a digest of the paper, "An Electronic Apparatus for the Study of the Human Operator in a One-Dimensional, Closed-Loop, Continuous Pursuit Task" (paper 52-8), recommended for presentation at the winter general meeting of the American Institute of Electrical Engineers (New York, January 21-25, 1952). The electronic pursuit apparatus described provides automatically several performance scores, such as mean error, mean square error, and time-on-target scores. It provides for two basic types of pursuit problems: (1) a following-pursuit operation (superimposition of a dot on a moving circle) and (2) a compensatory pursuit problem (the dot is stationary at the center of the display tube, and an error in tracing causes a proportional displacement of the circle). The apparatus is expected to aid in the determination of the range of problem variables to which man can learn to adapt himself and perform at a maximum level of skill.

Warren, C. E., 1952a
A. B. Fontaine, and J. R. Clark
A TWO-DIMENSIONAL ELECTRONIC PURSUIT APPARATUS. — Ohio State Univ. Research Foundation, Columbus (Contract AF 33(038)-10528); issued by Air Training Command. Human Resources Research Center. Perceptual and Motor Skills Research Lab., Lackland Air Force Base, Tex. Research bulletin no. 52-26, Aug. 1952. viii+104 p. (Project no. 509-020-0004) (TIP U25785). PB 108295

This report describes in detail the mechanical and electrical construction and design features of an apparatus for the study of human skill and skill learning in continuous two-dimensional pursuit tasks.

Warren, J. V. see Doyle, J. T., 1952
Wasserman, L. R. see Lawrence, J. H., 1952
Weaver, O. M. see Gordon, J. N., 1952
Wechsberg, P. see Guillemin, V., 1952

Wechsler, R. L., 1952
S. S. Kety, J. H. Comroe, and others
EFFECTS OF ACCELERATION UPON CEREBRAL METABOLISM AND CEREBRAL BLOOD FLOW. I. DEVELOPMENT OF A NEW METHOD FOR CONTINUOUS MEASUREMENT OF CEREBRAL FLOOD FLOW IN HUMANS UNDER ACCELERATION. — Aug. 15, 1952. iii+35 p. Naval Air Development Center. Aviation Medical Acceleration Lab., Johnsville, Pa. Report no. NADC-MA-5202 (Project report no. NM 001 060.03.01); and Univ. of Pennsylvania, Philadelphia. (TIP U24443). UNCLASSIFIED

The radioactive krypton (Kr^{79}) method was developed for the investigation of cerebral circulation during acceleration. This method is similar S. S. Kety's nitrous oxide method, substituting K^{79} for N_2O. It permits measurement of cerebral blood flow as often as 2-4 times in 30 seconds. The maximum amounts of Kr^{79} to which a normal subject would be exposed during the inhalation of Kr^{79} (in concentrations of 100 microcurie per liter) for 20 minutes was calculated to be 300 and 250 μc. in the lungs and in the remainder of the body, respectively. A scintillation counter, with a thallium-activated NaI crystal, will be used to record the Kr^{79} γ-rays. (TIP abstract, modified)

Wechsler, R. L. see also Duane, T. D., 1952, 1952a, 1952b

Weeren, J. T. van 1952
[STUDIES ON THE GEOGRAPHICAL ORIGIN, TRAINING, OCCUPATION, AND CAUSES OF REJECTION OF 2016 CANDIDATES WHO HAD BEEN GIVEN A PRELIMINARY EXAMINATION AT THE NATIONAL LUCHTVAART-GENEESKUNDIG CENTRUM IN 1952]. Onderzoek naar herkomst, opleiding, beroep en redenen van afkeuring van 2016 candidaten, die in 1952 bij het N. L. G. C. een eerst keuring voor vlieger ondergingen. — Aeromedica acta (Soesterberg, Netherlands), 1: 51-59. 1952. In Dutch, with English summary (p. 59). DSG

A total of 2016 aviation candidates who had been given their first physical check-up in the Dutch Aero-Medical Institute in 1952 were divided into groups according to domicile, occupation, and educational background. Most of the rejected candidates had held clerical occupations, while mechanics and manual craftsmen rated highest among those deemed fit for service. Unfitness due to vasomotor lability was found to be most frequent among high school and college students; dental defects were most frequently encountered amont the "miscellaneous" group (neither craftsmen, nor clerical employees or students). Seasonal influences were observed (rejection rates being higher during summer).

Weiner, J. 1952
and M. C. Leikind
VISIBILITY: A BIBLIOGRAPHY. — Library of

Congress. Technical Information Division, Washington, D. C. July 1952. vi+90 p. [Contract NAonr-13-47] (AD 10 557). UNCLASSIFIED

The bibliography covers articles and general works published from 1925 on the subject of visibility as influenced by the various physical, physiological, and psychological factors inherent in the observer, target, background, and atmosphere. Publications from various countries are included; foreign titles are given in English. The bibliography follows a classed subject arrangement. Among the principal topics are the following: theory of intensity discrimination and visual acuity, brightness levels and contrast, nonuniform brightness of background, glare, color vision, target size and distance, intensity-time relations of single target flashes, flicker fusion, monocular-binocular relations, accommodation and convergence, eye movements, retinal location of stimulation, peripheral vision, respiratory factors, anoxia, visual fatigue, effects of age, optical aids and colored filters, atmospheric factors in visibility, and engineering applications of visibility data (landing and approach aids, signaling, and instrument visibility).

Welch, E. see Strickland, B. A., 1952a

Welch, G. E., 1952
R. A. Bruce, W. G. Bridges, and A. D. Johnson
COMPARISON OF A NEW STEP TEST WITH A TREADMEILL TEST FOR THE EVALUATION OF CARDIORESPIRATORY WORKING CAPACITY. — Amer. Jour. Med. Sci., 223 (6): 607-617. 1952. DSG

Physiological responses of two groups of subjects were compared: 20 healthy subjects ranging in age from 22 to 49 years, and 20 patients with various cardiorespiratory conditions, 13 to 47 years. Each subject performed the treadmill test (walking at a rate of 1.7 m.p.h.), then the step test (requiring a single 9-inch-high step-up and return to the floor level at the rate of 20 steps per minute). Both tests were performed for ten minutes or less, depending on the individual tolerance. Respiratory rate, oxygen tension of the expired air, heart rate, and blood pressure were measured at 1-minute intervals through 4 minutes of rest, 1 minute of standing, 10 minutes of exercise, and 5 minutes of recovery. Despite the identical duration of the exertion, heart rate, systolic blood pressure, and OT and TQ ratio were slightly higher with the step test than with the treadmill test. With either form of test normal subjects had a higher respiratory efficiency between the ages of 22 and 36 years. In healthy subjects there was no arrhythmia or tachycardia under the physical stress. Among cardiac patients, 15 had a faster heart rate in the step test, and 5 displayed ventricular contraction usually at 2-3 minutes of exercise.

Wells, J. G. 1952
and T. J. Domanski
EFFECTS OF A MILITARY PROGRAM UPON PHYSICAL PERFORMANCE. — School of Aviation Medicine, Randolph Field, Tex. May 1952. iii+6 p. (Project no. 21-32-029; TIP U22414). PB 106893

The Aviation Cadet Program at Randolph Air Force Base was associated with a significant improvement in physical performance capacity as judged by performance on a treadmill. The improvement occurred during the first month of the program. At the end of the program the physical performance capacity was essentially the same as it had been at the conclusion of the first month of cadet training. The improvement in physical performance capacity was achieved without benefit of either regular or strenuous physical training activities. (School of Aviation Medicine abstract)

Wells, J. G. see also Gulley, W. E., 1952a
Werner, H. see Wapner, S., 1952
Wever, E. G. see Lawrence, M., 1952
Wheeler, D. E. see Rosenblith, W. A., 1952
Wheeler, L. J. see Dickson, E. D. D., 1952

Whipple, F. L. 1952
METEORITIC PHENOMENA AND METEORITES: THE CONTENTS OF INTERPLANETARY SPACE. — In: Physics and medicine of the upper atmosphere: a study of the aeropause, p. 137-170. Ed. by Clayton S. White et al. Albuquerque: University of New Mexico Press, 1952. DLC (RC1050.U5, 1952)

This is a review of the experimental and theoretical studies of the origin, distribution, composition, and physical characteristics of meteors, meteorites, and interplanetary dust and gases. Methods of calculating the chances of meteoritic encounter and of determining meteoritic penetration are presented. By way of safety precaution, orbits of comets and regions of high concentrations of asteroids and cometary debris (particularly between the planets Mars and Jupiter) should be circumnavigated in future interplanetary travel. Safety elements should be incorporated in the design of space ships, such as the socalled "meteor bumpers"— a secondary thinner skin located outside of the primary skin of the vessel at a distance of 1-2 centimeters. Optical surfaces should be shielded against micrometeoritic dust when not in use.

White, C. S., 1952
J. H. Humm, E. D. Armstrong, and N. P. V. Lundgren
HUMAN TOLERANCE TO ACUTE EXPOSURE TO CARBON DIOXIDE. I. SIX PER CENT CARBON DIOXIDE IN AIR AND IN OXYGEN. —Jour. Aviation Med., 23 (5): 439-455. 1952. DLC (TL555.A1A4, v. 23)

Test subjects (physicians and pilots) were exposed to the breathing of about 6% CO_2 in air or in oxygen (at an altitude of 5,000 feet above sea level). All but one subject completed 16 minutes of inhaling CO_2 without serious symptoms. The breathing had no significant influence on the outcome of a card-sorting test; the expiratory minute

volume was significantly increased in the two experimental groups (from 11-12 to 30-38 liters per minute); and the alveolar CO_2 tension rose in the course of the experiment. — The authors conclude that a CO_2 breathing test should be given to all pilot candidates as an indoctrination procedure.

White, C. S. 1952a
THE CHALLENGE TO SPACE MEDICINE. — Jour. Aviation Med., 23 (5): 527-529. 1952.
DLC (TL555.A1A4, v. 23)

The founding of the Space Medicine Association represents the recognition of new possibilities in aviation medicine. At the same time it imposes on its members the responsibility of studying the biological possibilities of human existence in the aeropause. The cooperation of affiliated disciplines must be secured for this purpose and a strong basic research program must be developed. The symposium on "Physics and Medicine of the Upper Atmosphere", held in San Antonio, Texas, in November 1951, may be considered a result of this much needed cooperation.

White, C. S. 1952b
and O. O. Benson (editors)
PHYSICS AND MEDICINE OF THE UPPER ATMOSPHERE: A STUDY OF THE AEROPAUSE. — xxiv+611 p., 46 pl. Albuquerque: University of New Mexico Press, 1952.

See analysis of this publication under: (Physics and Medicine), 1952.

Whitehorn, W. 1952
and J. W. Bean
CARDIAC CHANGES INDUCED BY O_2 AT HIGH PRESSURE, CO_2, AND LOW O_2, AS MANIFEST BY THE ELECTROCARDIOGRAM. — Amer. Jour. Physiol., 168 (2): 528-537. 1952.
DSG

Electrocardiograms were taken of decerebrated dogs exposed to oxygen pressures of 60 pounds. Comparisons were made with the effects of high CO_2 (11.5%) and low O_2 (8%) on another group of animals. A great similarity between the effects of hypercapnia and hypoxia on the one hand, and high-pressure oxygen on the other was observed. Pronounced bradycardia and an increase in P-R interval were found to be common symptoms. Denervation of the heart, while delaying the onset of bradycardia and slowing A-V conduction, did not prevent the occurrence of these phenomena.

Whiteside, T. C. D. 1952
ACCOMMODATION OF THE HUMAN EYE IN A BRIGHT AND EMPTY VISUAL FIELD. — Jour. Physiol. (London), 118 (4): 65P. 1952.
DLC (QP1.J75, v. 118)

Ocular accommodation relaxed to infinity was tested on 10 subjects with a small glass plate provided with a pattern of small black spots and observed through a 4-D lens. The pattern was visible only when the eye was focused on it. If the spots were out of focus, the subject saw an empty field having a brightness of 180 foot-lamberts. The empty field was seen with both eyes while the recognition of the glass plate was monocular. The experiment consisted in looking "in the distance" while the plate was slowly moved toward the subject. Fixation spots at predetermined distances helped to calibrate the visibility of the plate. In the attempt to relax accomodation to infinity, a mean of 1.7 D was exerted within 10 seconds of looking at a point 12-18 inches away. Ocular relaxation progressed until, after about 45 seconds, a mean of 1.16 D was attained.

Whiteside, T. C. D. 1952a
and K. Bazarnik
THE DAZZLE EFFECT OF AN ATOMIC EXPLOSION AT NIGHT. — Flying Personnel Research Committee (Gt. Brit.). Report no. FPRC 787, May 1952. 10+8 p. DSG (W1 qGR355).
UNCLASSIFIED

It was the objective of this investigation to determine the extent of blindness produced in a pilot flying at night and within visual range of an unexpected atomic explosion, and the extent of his ability to see his instruments again within a time sufficiently short as to allow him to retain control of the aircraft. The atomic flash was simulated by a telescope-shutter-mirror arrangement, through which the sun's disc was reflected and beamed into the eye of the test subject who was sitting in a dark room. For simulation of cockpit instruments, an air-speed indicator was used, illuminated by four standard ultraviolet cockpit lamps. The experiment led to the following conclusions: (1) an atomic explosion might blind a pilot for one to two seconds depending on the position of the flash in the pilot's field of vision; (2) by means of supplementary white floodlighting of the instrument pannel the blind period can be reduced sufficiently to enable the pilot to fly on instruments after 2-20 seconds (30 to 60 seconds if he looked directly in the flash, and less than 20 seconds at a distance of 10 miles or over). Variable control of the instrument floodlighting by means of an easily operable emergency switch is recommended for such eventualities to increase instrument brightness.

Whitney, K. R. 1952
NAVY AIR EVACUATION. — U. S. Navy Medical News Letter, 20 (8): 33-39. 1952.
DSG (W1 UN598, v. 20)

A critical discussion of tactical and administrative aspects of air evacuation is presented. The importance is stressed of thoroughly training "air evacuation corpsmen", flight nurses, flight surgeons, and all personnel indirectly involved in the operations. A system of classifying patients according to transportability and need of medical attention is developed (such as psychiatric patients of various degrees of aggressiveness, litter patients, ambulatory patients requiring medical assistance en route, patients with acute contagious diseases, patients suffering from tuberculosis, anemia, gaseous distention of the intestine, etc.).

Whittingham, D. G. V. see Morant, G. M., 1952

Whittingham, H. E. 1952
TREATMENT OF WATER SUPPLIES FOR AIRCRAFT. — Jour. Aviation Med., 23 (2): 186-193. 1952. DLC (TL555.A1A4, v. 23)

A description of the equipment and the methods used by the British Overseas Airways Corporation for the treatment and handling of water supplies for aircraft. The equipment includes water outlets, filters, and tank trolleys at the airport and water tanks and vacuum bottles on the aircraft. Chloramine-T is added to the water as a disinfectant and the equipment is cleansed and sterilized (by hyperchlorination) frequently. A detailed description of the sanitary maintenance of the water equipment is given.

Wickersham, R. A. see Alluisi, E. A., 1952

Wiesinger, K. 1952
L. Pircher, and W. V. Dobeln
[STUDY ON THE EFFECT OF QUICK BAROMETRIC CHANGES WITHOUT LACK OF OXYGEN] Étude sur l'effet des variations barométriques rapides sans manque d'oxygène. — Médecine aéronautique (Paris), 7 (4): 463-466. 1952. In French. DLC (TL555.M394, v. 7)

The origin of various physiological conditions, especially fatigue, in subjects exposed to abrupt changes of atmospheric pressure is discussed. Tests were carried out with repeated ascents to simulated altitudes of 5,000 to 10,000 m., at a rate of ascent of 150 m. per second, and descents at rates of 100 - 600 m. per second. The tests carried out on a small number of subjects showed individual differences in sensitivity and reaction to dysbarism. Decompression or compression alone does not produce fatigue. A rate of descent not exceeding 100 m. per second is advisable in order to make equalization of external pressure and pressure in the middle ear possible.

Wilcox, M. 1952
WILDERNESS SURVIVAL SCHOOL EDUCATES STUDENT PILOTS. — Canad. Aviation, 25 (4): 61. 1952. DLC (TL501.C33, v. 25)

A course in survival offered to students of Chinook Flying Service at Calgary, Canada, is briefly described. It involves instruction in navigation over long stretches of wilderness terrain, landing short with heavy loads, erection of improvised shelters, and protection from extreme cold.

Wilcoxon, H. C., 1952
W. Johnson, and D. L. Golan
THE DEVELOPMENT AND TRYOUT OF OBJECTIVE CHECK FLIGHTS IN PRE-SOLO AND BASIC INSTRUMENT STAGES OF NAVAL AIR TRAINING. — July 1, 1952. iii+61+27 p., 2 sample booklets in pocket. Psychological Corp., New York (Contract Nonr-442(00)(01); and Naval School of Aviation Medicine (Project report no. NM 001 058.24.01; Joint project report) (AD 1009). PB 109348

In order to assess the predictive power of flight check grades it has been recommended to administer two check flights to the same individual by different check pilots. A correlation coefficient calculated from the scores made by a group of students on the two check rides, provides the index of predictive power. The technical name for this statistical measure of the consistency of flight grade is called the "ride-ride reliability coefficient". Objective check-flight booklets were developed and tested in the presolo and basic-instrument stages. Reliability coefficients were computed from successive independent check rides on 100 students graded by the existing check-flight forms. The "ride-ride reliability" was not increased by the new objective forms. It is concluded that the complexity of the new forms made them impractical for routine use. More than one check flight should be given to provide reasonably accurate prediction. (AD abstract, modified)

Wilkes, W. H. 1952
ESCAPE FROM MULTIPLACE SUPERSONIC AIRCRAFT. — Boeing Airplane Co., Seattle, Wash. [1952]. 11 p. [Paper presented at Conference on "Problems of Emergency Escape in High Speed Flight", Sept. 29-30, 1952, at Wright-Patterson Air Force Base, Ohio] (AD 14 349). UNCLASSIFIED

The principal dangers involved in escape from an aircraft at supersonic speeds and high altitudes are as follows: (1) explosive decompression; (2) immobility due to uncontrollable airplane or injury; (3) possibility of collision with the airplane structure such as wings, fin, wheels, etc.; (4) possible high temperatures due to aerodynamic heating of the crewman; (5) extreme horizontal deceleration after entering the airstream; (6) physical harm due to air blast on face and body; (7) lack of oxygen; (8) extreme cold; and (9) inability to open the parachute due to unconsciousness. The implications of these dangers are briefly discussed, in as much as they apply to multiplace bombers operating at altitudes up to 60,000 feet and speeds up to Mach 2.

Wilkie, D. R. 1952
THE ACOUSTIC PROPERTIES OF FLYING HELMETS. — Jour. Acoust. Soc. Amer., 24 (2): 191-194. 1952. DLC (QC221.A4, v. 24)

A method is described to measure sound attenuation inside flying helmets by means of a small microphone. Measurements were carried out at 23 frequencies, from 0.12 to 7.0 kilocycles per second, and each helmet was tested on 12 subjects. A change of helmet design (altering of the shape of sealing rings, change from glass fiber to kapok insulation, etc.) improved sound attenuation characteristics in the lower frequencies. A theory of sound attenuation in flying helmets is outlined.

Williams, D. see Symonds, C., 1952
Wilson, J. S. see Doyle, J. T., 1952

Wilson, M. R. 1952
RED-GREEN FILTERS FOR SIMULATED INSTRUMENT FLYING. — School of Aviation Medicine, Randolph Field, Tex. Dec. 1952. 6 p. (Project no. 21-1207-0003; AD 1107).
PB 108323

Forty-five subjects with 20/20 vision were tested with no filter, and with red, green, blue, and amber filters, using the Armed Forces Visual Acuity Chart and the standard aircraft instrument figures mounted on a special chart. The colorless filter yielded the highest acuity followed by amber, green, red, and blue in descending order. The red and green filter combination appeared significantly superior to that of the blue and amber. (AD abstract)

Wilson, M. R. 1952a
EVALUATION OF THE EYE REFRACTOMETER. — School of Aviation Medicine, Randolph Field, Tex. Dec. 1952. 7 p. (Project no. 21-0201-0007; AD 3216). PB 108663

The Rodenstock "Eye Refractometer" is comparable in accuracy to the standard methods of retinoscopy in determining refractive errors under cycloplegia. The experienced retinoscopist requires approximately the same amount of time for determination of refractive errors using retinoscopy and the eye refractometer. The eye refractometer provides a method for accurate cycloplegic refracting at a great saving in time to the relatively inexperienced refractionist and can be accurately employed by the totally inexperienced technician after a few hours' indoctrination. (AF School of Aviation Medicine abstract)

Wing, K. G., 1952
J. D. Harris, A. D. Stover, and J. H. Brouillette
EFFECTS OF CHANGES IN ARTERIAL OXYGEN AND CARBON DIOXIDE UPON COCHLEAR MICROPHONICS. — Naval Medical Research Lab., New London, Conn. Report no. 188 (vol. 11, no. 5), Feb. 28, 1952. 6+37 p. (Project report no. NM 003 041.27.03; TIP U65869).
UNCLASSIFIED

While cochlear microphonics were being recorded by means of an electrode placed in the round window of the ears of anesthetized cats breathing different mixtures of oxygen in nitrogen through a resuscitator, samples of arterial blood were collected anaerobically to evaluate the various degrees of hypoxia. Simultaneous electrocardiographic tracings were usually obtained, and a few observations were made concerning effects of administered CO_2 upon microphonics. Cochlear microphonics were reversibly reduced by: (a) CO_2 within the limits used (i.e. between 5.2% and 25% CO_2 in O_2); and (b) when arterial oxygen-content was decreased to values roughly between the limits of 6-9 volumes percent and 2-3 volumes percent for as long as one-half hour. Complete recovery did not follow hypoxia below 2-3 volumes percent. No more than 8-9 seconds were required for a single inhalation of room air to elevated microphonics already depressed by hypoxia. The second generators of cochlear microphonics are thought to possess a very limited store of available energy for anaerobic function and are regarded as much more sensitive to hypoxia than has hitherto been believed. It is suggested that two physiological mechanisms which are unequally responsive to hypoxia may be involved in producing the microphonics. (Authors' abstract)

Winge, M. 1952
[HELICOPTER TRANSPORTATION OF CASUALTIES IN KOREA] Helikoptere til transport af sarede i Korea. — Militaerlaegen (København), 58 (4): 120-122. 1952. In Danish. DSG

A brief illustrated description of the evacuation of casualties at the Korean front is presented.

Winokur, G. see Ulett, G. A., 1952

Winterstein, H. 1952
[ALVEOLAR CARBON DIOXIDE TENSION AND ALTITUDE AIR] Alveolare Kohlensäurespannung und Höhenluft. — Pflügers Archiv für die gesamte Physiologie, 256 (2): 96-103. 1952. In German.
DLC (QP1.A63, v. 256)

Twenty-one healthy subjects, 20-25 years old, climbed a mountain to an altitude of 1850 m. [about 6070 feet]. At this altitude, the alveolar carbon dioxide tension proved to be significantly reduced in 19 of the subjects (before ascent, 42.0; after ascent, 37.2; before descent, 36.8; and after descent, 39.3 mm. Hg). The author interprets this reduction as being caused by a slight hypocapnia of the blood.

Winterstein, H. 1952a
(RESPIRATORY CHANGES IN MID-ALTITUDES) Orta yükseklikte solunum değişklikleri. — Tip fakültesi mecmuasi (Istanbul), 15 (2): 505-509. 1952. In Turkish, with English summary (p. 508-509). DSG (W1 IS784, v. 15)

A lowering of the alveolar CO_2 tension was observed in 19 out of 21 members of two excursions to Uludağ (1850 m.). The average CO_2 tension was 37.2 mm. Hg against 42 mm. at sea level (difference, 11.4%) while the mean increase in respiratory rate amounted to only 3.9%. The alveolar CO_2 tensions observed were considerably lower than the calculated values. The following hypothesis is advanced: the rarification of air facilitates the diffusion of CO_2 and thereby produces a lowering of the amount and pressure of CO_2 in the blood during the ascent, thus leading to a new equilibrium at a lower concentration.

Witkin, H. A. 1952
FURTHER STUDIES OF PERCEPTION OF THE UPRIGHT WHEN THE DIRECTION OF THE FORCE ACTING ON THE BODY IS CHANGED. — Jour. Exper. Psychol., 43 (1): 9-20. 1952.
DLC (BF1.J6, v. 43)

The effect of rotation upon perception of the

position of the body and of the immediate environment was measured with the following apparatus: a small fully-enclosed room moving around a circular track contained a chair which could be tilted to the right or left. The subject was asked to "straighten" the room if it appeared tilted and, in other trials, to "straighten" his body. The latter experiment was carried out with the room lighted or darkened (i. e. with or without a visual field). During rotation the room had to be tilted from the true upright toward the center of rotation to be perceived as upright. However, the magnitude of the shift of the force on the body was not proportional to the amount by which the room was tilted. The amount of body shift (usually directed toward the center of rotation) was less with than without the visual field. Marked individual differences were observed. Reliance on visual or postural standards in orientation varied with different subjects. The judging of body position on the basis of postural standard alone differed in the degree to which the body aligned with the displaced force acting upon it. Women appeared to adhere more closely to visual standards than men.

Wittern, W. W. von 1952
FORCE BALLISTOCARDIOGRAPHY. — Wright Air Development Center. Aero Medical Lab., Wright Patterson Air Force Base, Ohio. WADC Technical report no. 52-340, Nov. 1952. vi+32 p. (RDO no. 695-63; AD 12 715). UNCLASSIFIED

The ballistocardiogram (BKG) is a record of the oscillatory body motion which occurs with every heart beat and is therefore attributed to forces produced by the action of the heart. The BKG recordings were corrected to correlate directly with the heart action. The frequency response characteristic FRC_B of the external body network (all of the body mass except the heart and liver) was electrically measured with the subject on a shake-table, the head in a free-swinging hammock, and the hands gripping fixed electrode rods above the table. A correcting network was then inserted into the recording system to produce a frequency response characteristic of the measuring system which was inversely proportional to FRC_B. (AD abstract, modified)

Wittern, W. W. von see also Gierke, H. E. von, 1952
Wolfe, F. J. see Milton, J. L., 1952a

Wood, E. H. 1952
and E. H. Lambert
SOME FACTORS WHICH INFLUENCE THE PROTECTION AFFORDED BY PNEUMATIC ANTI-g SUITS. — Jour. Aviation Med., 23 (3): 218-228. 1952. DLC (TL555. A1A4, v. 23)

Various factors which affect the protection against positive acceleration afforded by pneumatic antiblackout suits, were studied on the human centrifuge. — Inflation of the suit at 1 g produced a rapid increase in arterial blood pressure, which was followed by a slowing of the heart rate (carotid sinus and aortic depressor reflexes). This slowing could be prevented by administration of tetraethylammonium chloride. — The effects of inflation of the component parts of the antiblackout suit were compared with those of the whole suit: protection afforded by the leg bladders alone was 0.2 g; by the abdominal bladder alone, 0.6 g; and by both combined, 1.2 g. — Straining or pulling on a stick with 19 lb. of force per g afforded a protection of 0.7 g which was added to that of the pressure suit. Performing the Valsalva maneuver (voluntary maintenance of intrathoracic pressure) increased acceleration tolerance when a pressure suit was worn, but decreased it when it was done without a suit. The M-1 maneuver (a series of brief Valsalva maneuvers) alone afforded a protection of 0.4 to 5.2 g; when combined with the wearing of a pressure suit, the effect was less than the sum of the individual protective effects. — Pressure breathing as well as a crouching position enhanced the protection afforded by the suit.

Wood, E. H. see also Nahas, G. G., 1952
Wool, G. N. see Schiller, A. A., 1952

Worchel, P. 1952
ROLE OF THE VESTIBULAR ORGANS IN SPACE ORIENTATION. — Jour. Exper. Psychol., 44 (1): 4-10. 1952 DSG

Two types of tests were given to 8 groups (each consisting of 4 totally or partially deaf test subjects). In the first test the subjects were led around two legs of a triangular path and asked to return unaided over the remaining leg to the starting position. In the second test the subjects were led along one leg of a triangular path and asked to return by way of the two remaining legs. Test I was performed better by a test group consisting of totally deaf subjects without vestibular sensitivity than by the vestibular-sensitive groups. In Test II both groups behaved alike. The degree of deafness and its etiology (congenital versus adventitious deafness) seemed to have no bearing on the orientation facilities. Inferior performance is attributed to stimulation of the semicircular canals rather than the utriculo-saccular organs, and compensatory functioning of the kinesthetic organs is believed to account for the better performance of the vestibular-deficient group (similar relationships had been established in orientation experiments with blind subjects). No relationship between age or sex and spatial orientation could be established.

Wright, G. W. see Branscomb, B. V., 1952
Wulfeck, J. W. see Crook, M. N., 1952

Wulfften Palthe, P. M. van 1952
SOME OBSERVATIONS ON THE PSYCHOLOGY OF THE AVIATOR. — Aeromedica acta (Soesterberg, Netherlands), 1: 23-42. In English. DSG

The professional careers and personal characteristics of 173 pilots are summarized on the basis of surveys made by the National Aeromedical Center at Soesterberg (Netherlands), in the years 1914 to 1924. The objective of the investi-

gation is to define the pilot as a "psychological type". The treatment is general and is primarily concerned with the ethical and philosophical implications of flying.

Wulfften Palthe, P. M. van 1952a
and G. Hage
[PHACOMATA] Phakomata. — Aeromedica acta (Soesterberg, Netherlands), 1:45-50. 1952. In Dutch, with English summary (p. 50). DSG

Medical officers examining flying candidates are advised to watch for such conditions as phacomata, fibromata, dystopic hair growth, polythelia, and hyper- and depigmentations. These phenomena may constitute the only clues towards the detection of constitutional hereditary defects. Among 417 candidates recently examined at Soesterberg, 55 showed one or more types of these symptoms.

Wulfften Palthe, P. M. van 1952b
[THE EFFECT OF FLICKERING LIGHT ON CEREBRAL ACTIVITY AT VARYING DEGREES OF OXYGEN DEFICIENCY] De invloed van intermitterende lichtflitsen op de cerebrale activiteit bij verschillende graden van zuurstofgebrek. — Aeromedica acta (Soesterberg, Netherlands), 1: 69-84. 1952. In Dutch, with English summary (p. 83-84). DSG

Electroencephalograms were taken of rabbits during exposure to light stimuli generated by a stroboscope adjustable to various flicker rates. In animals breathing normal air, continuous lighting of one eye produced shallow brain waves of great amplitude. Mild hypoxia (10% oxygen) had no effect on the brain wave pattern. At a higher degree of hypoxia (5% oxygen), throughs and peaks appeared in the curve. Breathing of an air mixture containing 4% oxygen caused initial flattening of the electroencephalogram waves, changing, after 20 minutes exposure, to a jagged pattern. At this stage convulsions set in leading to final death of the animal. Intermittent light stimuli (5.5 per second) in normal air gave rise to shallow waves of great amplitude. Higher frequencies caused no change in the wave pattern. In an atmosphere containing 10% oxygen, high flicker frequencies (25 and 50 per minute) caused jagged patterns but no outward symptoms such as convulsions, changes in heart rhythm, or respiration. Photogenic lowering of consciousness often observed in pilots had led to the foregoing investigation.

Wulfften Palthe, P. M. van 1952c
[STUDY ON THE CORRELATION OF SIMPLE ATTENTION AND CONCENTRATION TEST SCORES WITH THOSE FROM A BATTERY OF PSYCHOLOGICAL TESTS] Onderzoek naar de correlatie van een eenvoudige aandachtsconcentratieproef met de uitkomsten van het vigerend psychologisch onderzoek. — Aeromedica acta (Soesterberg, Netherlands), 1: 85-95. 1952. In Dutch, with English summary (p. 94-95). DSG

Two tests, forming part of pilot selection procedures in the Netherlands, were compared. One was the Bourdon-Wiersma-Godefroy attention test used by the Dutch National Aero-Medical Center, originally designed to detect latent epilepsy but serving well to measure alertness, persistency and acuity. The other was a battery test used by the selection board of the Royal Netherlands Air Force. It consists of a combination of intelligence, mental development, coordination, Rohrschach, and written Szondy tests, implemented by interviews and group field tests. An analogous scoring system was applied to both testing procedures. In comparing the scores of a sample group of 100 candidates, a correlation coefficient of 0.575 between the Bourdon and the battery test was found.

Yarnold, J. K. see Tupes, E. C., 1952e
Young, B. B. see Bauer, R. O., 1952
Yourick, G. A. see Berkeley, M. H., 1952

Zaccaria, L. 1952
and J. A. Cox
DIFFERENTIAL VALIDITY OF THE AIRCREW CLASSIFICATION BATTERY (FEBRUARY 1947) FOR ASSIGNMENT TO BASIC PILOT TRAINING. — Air Training Command, Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. PERS 52-38, Dec. 1952. 3 p. (Project no. 503-001-0012; AD 146). UNCLASSIFIED

A study was made to determine the relationship between test and nontest variables of the Aircrew Classification Battery and the scores used for the assignment of primary flying-school graduates to single- and multi-engine pilot training. The sample consisted of 635 aviation cadets in classes 50G through 52B who had successfully completed primary flying training at the Goodfellow AF base. The scores were obtained by summing points derived from (1) student self-ratings, (2) instructor ratings, and (3) flight commander ratings. The variables showed little relationship to the scores for assignment to single- or multi-engine training. A tendency appeared for older students to obtain high suitability scores for multi-engine training, while students with high scores on the Pilot Complex Coordination and Biographical Data Blank tended to obtain high suitability scores for single-engine training. (AD abstract)

Zaccaria, L. 1952a
and J. A. Cox
COMPARISON OF AVIATION CADETS AND STUDENT OFFICERS IN PRIMARY PILOT TRAINING. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. PERS 52-41, Dec. 1952. 7 p. (Project no. 503-001-0012; AD 6128). UNCLASSIFIED

Comparisons were made of 1016 aviation cadets (AC) and 547 student officers (SO) with respect to: (1) pilot stanines and four categories of graduation-elimination status and (2) validity coefficients for 1947 Aircrew Classification Battery variables with graduation or elimination from primary pilot training as the criterion. Tabulated

data indicate significant differences between the AC and SO with respect to graduation or elimination from primary training. More SO's than than AC's were graduated; fewer SO's than AC's were eliminated for flying deficiency. The means of the individual variables for the SO sample tended to be higher than those for the AC sample; the standard durations were smaller than for the AC's. Self-selection appeared to operate to increase the means and restrict the range of aptitudes measured by the variables for SO. Variations in flying-deficiency elimination were ascribed to the mean aptitude inequalities. Motivational elimination differences were attributed to differential treatments, attitudes, and interest between the two groups. (AD abstract)

Zachert, V. 1952
and E. H. Shibe
FACTOR ANALYSIS OF THE AIRMAN CLASSIFICATION BATTERY WITH CLERK-TYPIST FINAL SCHOOL GRADE. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. PERS 52-39, Dec. 1952. 11 p. (Project no. 503-001-0003; AD 6127). UNCLASSIFIED

A factor analysis was made of a non career-guided sample of 301 clerk-typist (C-T) graduates; the study was based on intercorrelational matrices of the final C-T school grades, 11 pre-operational Air Force Tests, and two biographical inventory (BI) keys. A career-guided analysis was made of the final C-T school grades, Airman Classification Battery AC-1A, five BI's, and education of 1965 C-T graduates. Factors common to both analyses included numerical facility, mechanical experience, verbal comprehension, visualization, perceptual speed, and BI-interest in things versus ideas or general biographical. The academic information factor was specific to the first analysis, and the technical information and education factors were specific to the second analysis. (AD abstract)

Zachert, V., 1952a
G. Friedman, and E. Shibe
THE DEVELOPMENT OF BIOGRAPHICAL INVENTORY CE607A, AVIATION CADET. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. PERS 52-44, Dec. 1952. 4 p. (Project no. 503-001-0011; AD 8131). UNCLASSIFIED

The inventory was developed as a selection device for second lieutenants from aviation cadet classes. The problems involved and criteria used in devising the empirical scoring key are discussed. (AD abstract)

Zachert, V. 1952b
and W. E. Hempel
TWO TECHNIQUES OF FACTOR ANALYSIS OF THE AIRMAN CLASSIFICATION BATTERY AC-1A AND AIRCRAFT MAINTENANCE FUNDAMENTALS TECHNICAL SCHOOL; FINAL GRADE. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. PERS 52-48, Dec. 1952. 15 p. (Project no. 503-001-0001; AD 7955). UNCLASSIFIED

Two analyses were conducted on 2082 career-guided airmen; the same intercorrelations were used in each analysis. An increase in communalities resulted from the use of a new iterative process in Analysis II. The 6 factors common to both analyses were verbal, mechanical experience, numerical, interest-in-things vs. interest-in-ideas, technical information, and perceptual speed. The 2 additional factors only in Analysis I were visualization and educational background. The final school grade had a communality of 0.50 with Analysis I, as compared with 0.47 with Analysis II; much of the criterion variance remained unexplained. Analysis I gave significant loadings on the mechanical experience (0.43) and verbal (0.34) factors. (AD abstract)

Zachert, V. 1952c
and T. Sucher
VALIDITY OF ATTITUDE SURVEY (FORMS A AND B) FOR FIVE AIR FORCE TECHNICAL SCHOOLS. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. PERS 52-8, Feb. 1952. 3 p. (Project no. 503-001-0001; ATI 175 536). UNCLASSIFIED

As a supplement to the Attitude Survey (Forms A and B), a 32-item multiple-choice questionnaire was devised to evaluate positive and negative attitudes of basic airmen to morale, leadership, ratings, punishment, mess, and equality. Both graduates and eliminees from various technical schools of the Air Force answered the questionnaire. The following conclusions were reached: (1) The Attitude Survey has no validity for prediction of final technical school grades, in the areas studied. (2) Further research should be accomplished on the current form of the Attitude Survey; it might possibly be scored by separate keys for different technical schools or aptitude clusters; empirical keys might contribute a substantial gain in validity and may make possible a reasonable contribution of the Attitude Survey scores to the multiple correlations of the Airman Classification Battery. (3) Against a criterion other than final technical school grades the Attitude Survey might show a greater degree of validity. (Authors' conclusions and recommendations, modified)

Zachert, V. 1952d
FACTOR ANALYSES OF THE ARMY, NAVY, AND AIR FORCE CLASSIFICATION BATTERIES. — Air Training Command. Human Resources Research Center. Personnel Research Lab., Lackland Air Force Base, Tex. Research bulletin no. 52-12, March 1952. vii+20 p. (Project no. 503-001-0017; TIP U22499). PB 107020

Both Army and Navy classification batteries were given to 1052 naval recruits in 1947. The factor analysis of the combined 18-variable ma-

trix showed 6 factors, identified as mechanical experience, perceptual speed, verbal comprehension, numerical facility, visualization, and general reasoning. The Army and Air Force classification batteries were given to 300 soldiers and 1800 airmen in 1950. The factor analysis of the 44-variable matrix showed 7 ability factors, tentatively identified as mechanical experience, perceptual speed, verbal comprehension, numerical facility, visualization, general reasoning, and technical or radioelectrical information. The three interest factors found were labeled as follows: (1) interest I, an Army preference blank factor, perhaps a clean-hands vs. dirty-hands interest; (2) interest II, a biographical inventory factor of interest in things vs. ideas; and (3) interest III, an Army preference blank factor of interest in precision crafts. The intercorrelation of group factors were high in the Army and Air Force study. In a 2-factor unrotated solution the centroid factors suggested a mechanical factor and a clerical or academic factor. The results suggested the desirability of a core battery for all the classification batteries to draw upon. (From TIP abstract)

Zachert, V. 1952e
and G. Friedman
FACTORIAL COMPARISONS OF TWO AIRCREW CLASSIFICATION BATTERIES WITH AND WITHOUT THE VARIABLE OF PREVIOUS FLYING EXPERIENCE. — Air Training Command. Human Resources Research Center. Personnel Research Lab., Lackland Air Force Base, Tex. Research bulletin no. 52-16, April 1952. v+18 p. (Project no. 503-001-0012; TIP U23349). PB 107234

Factor analyses were made to determine whether abilities measured by the Aircrew Classification Battery introduced in June 1945 were comparable to abilities measured by the battery introduced in Feb. 1947. The two batteries had similar factorial content. The following 11 valid factors were found in 4 analyses: mechanical experience, psychomotor coordination, perceptual speed, socio-economic background, numerical facility, general reasoning, psychomotor precision, pilot or flying interest, spatial relations, verbal comprehension, and visualization. All of these factors were identified and reported in previous analyses of the wartime classification batteries. An additional factor was identified as the age-education doublet in the postwar studies. The only factor which had significant difference in the analyses was pilot or flying interest, which was strongly related to previous flying experience. (TIP abstract)

Zeman, F. see Lichtenberg, J., 1952
Ziegler, J. E. see Duane, T. D., 1952, 1952a, 1952b

Zimmer, C. E., 1952
and E. S. Fleming
COMPARISON OF FRESHMAN ENTRANCE EXAMINATION SCORES OBTAINED BY CADETS IN THE THREE ROTC UNITS, UNIVERSITY OF TEX. — Air Training Command. Human Resources Research Center, Lackland Air Force Base, Tex. Research note no. PERS 52-59, Dec. 1952. 4 p. (Project no. 503-002-0007; AD 3225). UNCLASSIFIED

The scores on the American Council on Education Psychological Examination and on the Pre-Engineering Inventory for cadets enrolled in the College of Engineering are compared for the Army, Navy, and Air Force freshman cadets. Results indicate that the selection procedures used by the Navy in screening men for admission are effective in producing students of higher quality than those obtained by the Army or Air Force, who did not screen their men. (AD abstract)

Zwislocki, J. 1952
and E. Pirodda
ON THE ADAPTATION, FATIGUE AND ACOUSTIC TRAUMA OF THE EAR. — Experientia (Basel), 8 (7): 279-284. 1952. In English. DSG

Measurements of hearing thresholds following acoustic stimulation reveal a fundamental difference between adaptation effect and acoustic trauma. The elevation of the hearing threshold because of adaptation is determined by the intensity of acoustic stimulation, but is not affected by rapidly repeated stimulation. Adaptation takes place in two steps: the first step occurs almost instantaneously and accounts for the greater proportion of threshold elevation. The second phase develops more slowly. Regression of adaptation takes place in reverse order. Acoustic trauma is caused by considerably higher sound intensities. The paper attempts to establish a correlation between adaptation and nerve potential, and between acoustic trauma and cochlear potential.

Zwislocki, J. 1952a
WAVE MOTION IN THE COCHLEA DUE TO BONE CONDUCTION. — Harvard Univ. Psycho-Acoustic Lab., Cambridge, Mass. Report no. PNR-138, [1952]. 4+13 p. (Contract N5ori-76, Task order 2; AD 24 675). UNCLASSIFIED

Literature concerning the relationship between bone conduction and cochlear dynamics is critically reviewed. A mathematical analysis is presented to demonstrate that the vibration pattern of the cochlear partition is independent of the path by which sound is transmitted to the cochlea. First, by means of the hydrodynamic principle of continuity, it is demonstrated that vibration introduced by bone conduction or through an artificial window is canceled by a tone transmitted through the oval window. Second, a general differential equation of hydrodynamic surface waves is presented to show that wave length is independent of the place at which the sound is introduced into the cochlea. Third, it is deduced from Hamilton's principle of stationary energy that transverse waves travel in the cochlea from the base toward the apex, irrespective of the location of the sound source. (AD abstract)

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This is a listing of agencies and contractors which issued reports. United States Government agencies will be found under U. S., agencies of foreign governments under their respective countries. Universities and private institutions or corporations are listed under the most distinctive parts of their names.

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Groot, S. G. de, 1952
Harris, J. D., 1952, 1952a
Naval Med. Res. Lab., 1952
Rawnsley, A. I., 1952, 1952a
Schaefer, K. E., 1952, 1952a
Sexton, M. S., 1952
Wing, K. G., 1952

Naval Radiological Defense Lab.
Kimeldorf, D. J., 1952a, 1952b

U. S., NAVY (Continued)
Naval School of Aviation Medicine
Atkinson, C. J., 1952, 1952a
Bair, J. T., 1952, 1952a, 1952b
Black, J. W., 1952
Boring, R. O., 1952
Cannon, J. L., 1952, 1952a
Clark, B., 1952, 1952a, 1952b, 1952c, 1952d
Doyle, J. T., 1952a
Graettinger, J. S., 1952
Graybiel, A., 1952c, 1952d
Guedry, F. E., 1952, 1952a
Hall, A. L., 1952, 1952a, 1952b, 1952c, 1952d
Hollander, E. P., 1952, 1952a, 1952b
Johnson, W., 1952
Maag, C. H., 1952
McLaughlin, S. C., 1952
Madden, W. F., 1952
Mann, G. W., 1952b, 1952c, 1952d
Niven, J. I., 1952
Packard, J. M., 1952a, 1952b
Poe, A. C., 1952, 1952a, 1952b
Schaefer, H. J., 1952b, 1952c
Stauffer, F. R., 1952
Thetford, P. E., 1952
Trumbull, R., 1952, 1952a
Wilcoxon, H. C., 1952

Office of Naval Research
Verplanck, W. S., 1952

Naval Research Lab.
Halsey, R. M., 1952
Morgan, C. T., 1952
Pollock, W. T., 1952
Sleight, R. B., 1952a

Special Devices Center
Sleight, R. B., 1952
Tufts Exper. Psychol., 1952

Philadelphia Naval Hospital
Chinn, H. I., 1952f

U. S., OFFICE OF TECHNICAL SERVICES
Off. Tech. Services, 1952

U. S., RESEARCH AND DEVELOPMENT BOARD
Duncombe, A., 1952
Plant, W. H., 1952

VIRGINIA, UNIV.
Long, E. R., 1952, 1952a

WASHINGTON UNIV.
Covell, W. P., 1952
DuBois, P. H., 1952
Ulett, G. A., 1952

SUBJECT INDEX

ACCELERATION (incl. Deceleration)
  effects on cerebral circulation
    Wechsler, R. L., 1952
  effects on fluid distribution
    Gell, C. F., 1952
  effects on spatial orientation
    Clark, B., 1952
    Graybiel, A., 1952a, 1952b
    Witkin, H. A., 1952
  general physiological effects
    Gubernale, A., 1952
  measurement
    MacPherson, A. E., 1952
  tolerance (see also Anti-g suits; see also Effects on acceleration tolerance under Posture, Prone position flight, and Supine position flight)
    Bugard, 1952
    Koochembere, C. T., 1952
    Savely, H. E., 1952

ACCELERATION (NEGATIVE)
  effects on cerebral circulation
    Duane, T. D., 1952, 1952a, 1952b
  effects on respiration
    Duane, T. D., 1952, 1952b

ACCELERATION (POSITIVE)
  effects on heart
    Pryor, W. W., 1952
  tolerance (see also Anti-g procedures)
    Stauffer, F. R., 1952

Acceleration (Smaller than 1 g) see Subgravity

ACCELERATION (TRANSVERSAL), tolerance
    Ballinger, E. R., 1952

ACCIDENT PRONENESS
    McFarland, R. A., 1952
    Malmejac, J., 1952a
  physiological factors
    Madden, W. F., 1952

ACCIDENTS (see also Aviation casualties; Crash injuries)
  analysis
    Jones, W. L., 1952
    Phillips, R. B., 1952
    Switzer, R. E., 1952
    Tryon, G. H., 1952
  engineering factors
    Hasbrook, A. H., 1952
    McSurely, A., 1952
    Tye, W., 1952
  human factors
    Bergeret, P., 1952
    Bur. Safety Invest., 1952c, 1952d, 1952e, 1952f
    Civil Aeronaut. Board, 1952, 1952a

Accidents (Continued)
  prevention (see also entries under Safety)
    Moss, W. M., 1952
    Moss, W. W., 1952a
    Switzer, R. E., 1952
  statistics
    Anon., 1952bk, 1952m
    Bjuggren, B., 1952
    Bur. Safety Invest., 1952, 1952a, 1952b, 1952c, 1952d, 1952e, 1952f
    Heyl, E. B., 1952
    Lombard, C. F., 1952
    Moss, W. M., 1952
    Schreiber, H., 1952
    Tye, W., 1952
Acclimatization see Altitude acclimatization
Accommodation see Visual accommodation

ACHIEVEMENT TESTS
    Dickie, R. D., 1952
    Thorndike, R. L., 1952a
    Tupes, E. C., 1952b

ACOUSTICAL COMFORT
    Lippert, S., 1952

Acoustical trauma see Effects on hearing under Airplane noise; Engine noise; and Noise. See also Deafness
Action potentials see under Auditory nerve; Cochlea; Muscular system. See also Brain waves and entries concerning the electrocardiogram under Heart
Acuity see Visual acuity
Adaptation see Altitude acclimatization; Auditory adaptation; Retinal adaptation

ADRENAL GLANDS
  effects of altitude
    Cerf, J., 1952
    Kline, R. F., 1952
  effects of anoxia
    Malmejac, J., 1952b, 1952e
  effects of noise
    Hale, H. B., 1952a

Aeroembolism see Decompression sickness
Aeropause see High altitude

AEROPLAST
    Choy, D. S. J., 1952

AEROTITIS MEDIA
    Anon., 1952bs
    Box, N. E. H., 1952
    Dhiraputra, S., 1952
    Hyde, R. W., 1952, 1952a

AFTER-SOUND
    Flottorp, G., 1952

AGE (see also Age factors under Aviators, Personnel, and Pilots; and Relation to age under Body measurements)
relation to arteriosclerosis
Ogle, D. C., 1952
relation to brain waves
Damasio, R., 1952
relation to decompression sickness
Cotes, J. E., 1952a
relation to visual accommodation
Clements, R., 1952

Air see Air purification; Gas in body cavities
Air blast see Blast

AIR CREWS
attitudes
Berkowitz, L., 1952
Personnel Res. Board, 1952
nutrition
Anon., 1952bf
performance
Hemphill, J. K., 1952, 1952b
Knoell, D., 1952
Marley, F. W., 1952
test methods
Hemphill, J. K., 1952, 1952a
Personnel Res. Board, 1952
training
Dinsmore, R. A., 1952
Hemphill, J. K., 1952a

Air evacuation see Air transportation of patients
Air pressure see Barometric pressure; Pressure cabins

AIR PURIFICATION
Clamann, H. G., 1952
Specht, H., 1952

Air sickness see Altitude sickness; Motion sickness
Air transportation see Air transportation of patients; Medical personnel, air transportation; Passenger transportation

AIR TRANSPORTATION OF PATIENTS (see also Ambulance helicopters, Ambulance planes; Helicopters, use in air evacuation)
Anon., 1952ac, 1952ax
Gordon, B. L., 1952
Jordi, A. U., 1952a
Lichtenberg, J., 1952
Lo Monaco Croce, T., 1952a
Martin, M. T., 1952
Strickland, B. A., 1952
Whitney, K. R., 1952
deodorization
Gee, A. H., 1952, 1952a
Europe
Postle, J. A., 1952
Korean campaign
Anon., 1952af, 1952g, 1952y
Armstrong, G. E., 1952
Armstrong, H. G., 1952
Kater, N. M., 1952
Knoepfel, H. K., 1952
Pugh, L., 1952

Air transportation of patients (Continued)
Korean campaign (Continued)
Smith, A. D., 1952
Winge, M., 1952
legal aspects
Dunnahoo, G. L., 1952
safety
Anon., 1952aw
Johnston, M. B., 1952
Rodewald, F. A., 1952
Scotland
Anon., 1952l

AIR TRANSPORTATION OF PATIENTS (by pathological condition)
Jordi, A. U., 1952a
Whitney, K. R., 1952
(cardiovascular diseases)
Downey, V. M., 1952
Gordon, B. L., 1952
Plas, F., 1952
Smedal, H. A., 1952
(communicable diseases)
Dunnahoo, G. L., 1952
(gas in body cavities)
Anon., 1952aj
Burkhardt, W. L., 1952
Pollard, J. P., 1952
(head injuries)
Burkhardt, W. L., 1952
(mental diseases)
Strickland, B. A., 1952a
(poliomyelitis)
Hunley, H. C., 1952
(respiratory diseases)
Downey, V. M., 1952
Gordon, B. L., 1952
Smedal, H. A., 1952

AIRCRAFT (see also Airplanes; Helicopters), human engineering
Anon., 1952aa
Beals, L. S., 1952
Buettner, K., 1952a
Daley, E. A., 1952
Hunsaker, J. C., 1952
Janitz, A. E., 1952

AIRCRAFT BRIGHTENERS, toxic effects
Chem. Corps Med. Lab., 1952

AIRPLANE CONTROLS (see also Control knobs; Instrument panels; Pedals), human engineering
Anon., 1952b
Simon, C. W., 1952

AIRPLANE FLIGHT
effects on blood pressure
Tucci, E. A., 1952
effects on blood sugar
Lundberg, U., 1952
in treatment of whooping cough
Seabra, P., 1952
Villalong, J., 1952
safety (see also Accidents)
Lombard, C. F., 1952

AIRPLANE NOISE
analysis
Neely, K. K., 1952
effects on hearing
Anon., 1952az
Dhiraputra, S., 1952
Lippert, S., 1952
Murga, R. H., 1952
Senturia, B. H., 1952
reduction
Dickson, E. D. D., 1952
Hubbard, H. H., 1952
Smith, E. A., 1952
Wilkie, D. R., 1952

AIRPLANES (see also Ambulance planes; see also parts of airplanes, e.g., Cabins, Airplane controls, etc.)
human engineering
Baldes, E. J., 1952
Crash Injury Res., 1952a
DeHaven, H., 1952c
Hasbrook, A. H., 1952
Moss, W. W., 1952a
Tye, W., 1952
kitchen facilities
Anon., 1952s
Hill, J. C., 1952
sanitation
Duguet, J., 1952a

AIRPORTS
hospital facilities
McIntyre, E., 1952
human engineering
Doesschate, G. T. ten, 1952

ALCOHOL (ETHYL)
effects on altitude tolerance
Fortier, G., 1952
effects on pilot performance
Stovall, W. R., 1952
effects on vision
Cibis, P. A., 1952
Ferraris de Gaspare, P. F., 1952

ALERTNESS (see also Vigilance)
Fraser, D. C., 1952

Alkaloids see Atropine; Hydergine; Scopolamine; Tobacco

ALTITUDE (see also Anoxia; High altitude)
effects on blood
Forcher-Mayr, O., 1952
Fryers, G. R., 1952
Grognot, P. A., 1952c
Hale, H. B., 1952
Hall, A. L., 1952b
Kline, R. F., 1952
Lalli, G., 1952
Redmond, R. F., 1952
Reissmann, K. R., 1952
Schiller, A. A., 1952
Smith, W. W., 1952
Terzioğlu, M., 1952b
Vacca, C., 1952

Altitude (Continued)
effects on blood (Continued)
Verzár, F., 1952
Winterstein, H., 1952a
effects on circulation
Cannon, J. L., 1952a
Deschwanden, J. von, 1952
Girling, F., 1952
Jungmann, H., 1952
Luria, L., 1952
Marbarger, J. P., 1952
effects on digestive system
Cordier, D., 1952
Gaspa, P. H., 1952
Jackson, M. M., 1952
Steggerda, F. R., 1952, 1952a, 1952b
effects on ear
Anon., 1952bs
effects on embryonic development
Ingalls, T. H., 1952
effects on endocrine system
Cerf, J., 1952
Flückiger, E., 1952
Kline, R. F., 1952
effects on excretion
Marshall, L. H., 1952
effects on fertility
Anon., 1952ai
effects on immunity
Berry, L. J., 1952, 1952a
effects on respiration
Hall, A. L., 1952a
Rahn, H., 1952
Winterstein, H., 1952
effects on speech communication
Atkinson, C. J., 1952a
effects on teeth
Anon., 1952bs
Wannemacher, E. P., 1952
effects on tissue composition
Cullumbine, H., 1952
effects on vision
Mercier, A., 1952
relation to arthritis
Jones, H. L., 1952
research
Cook, S. F., 1952
tolerance
Bauer, R. O., 1952a
Bugard, 1952
Fortier, G., 1952
Gross, F., 1952, 1952a
Hall, A. L., 1952, 1952c
Hurley, L. A., 1952
Wiesinger, K., 1952

ALTITUDE ACCLIMATIZATION
effects on blood
Fryers, G. R., 1952a
Lawrence, J. H., 1952
Terzioğlu, M. N., 1952, 1952a, 1952b
effects on brain
Opitz, E., 1952a
effects on cardiovascular system
Dexter, L., 1952
effects on immunity
Berry, L. J., 1952a, 1952b

Altitude acclimatization (Continued)
effects on muscular system
Clark, R. T., 1952a
effects on retina
Opitz, E., 1952
general physiological effects
Altland, P. D., 1952
Hernando, O. J., 1952
Luft, U. C., 1952
Vellard, J., 1952, 1952a
pathological effects
Chiodi, H., 1952
Lublin, A., 1952
research
Anon., 1952q, 1952ah
role of endocrine system
Verzár, F., 1952a

ALTITUDE SICKNESS (see also Decompression sickness)
Allard, A., 1952a

ALTITUDE SUITS
Anon., 1952d, 1952h, 1952x
Henry, J. P., 1952a, 1952b
Hull, W. E., 1952a, 1952c
Kennedy, J. V., 1952
Middleton, R. H., 1952a
Vail, E. G., 1952b

ALVEOLAR CARBON DIOXIDE TENSION
Hall, F. G., 1952
Winterstein, H., 1953, 1952a

AMBULANCE HELICOPTERS
Anon., 1952z, 1952an

AMBULANCE PLANES, equipment
Anon., 1952ax
Johnston, M. B., 1952
Pollard, J. P., 1952

AMPHETAMINE AND DERIVATIVES (Benzedrine, Dexedrine)
effects on pilot performance
Frederick, W. R., 1952
Stovall, W. R., 1952
psychological effects
Anon., 1952bi

Amyl nitrite see Nitrites

ANESTHETICS, effects on blood pressure
Brown, B., 1952

Anoxemia see Anoxia

ANOXIA (see also Altitude)
effects on blood
Arnould, P., 1952
Clark, R. T., 1952
Dreyfus, C., 1952
Maurath, J., 1952
effects on brain
Damasio, R., 1952
Gordon, J. N., 1952
Grandpierre, R., 1952e, 1952i
Grenell, R. G., 1952

Anoxia (Continued)
effects on brain (Continued)
Lucas, B. G. B., 1952
Luft, U. C., 1952a
Malmejac, J., 1952, 1952c
Tabusse, L., 1952a, 1952c
Wulfften Palthe, P. M. van, 1952b
effects on circulation
Aviado, D. M., 1952, 1952a
Beard, E. F., 1952, 1952a
Brown, A. L., 1952, 1952a
Brown, B., 1952
Doyle, J. T., 1952
Gollwitzer-Meier, K., 1952
Huerkamp, B., 1952
Lewis, B. M., 1952, 1952a
Storstein, O., 1952
Whitehorn, W., 1952
effects on cochlea
Lawrence, M., 1952
Wing, K. G., 1952
effects on endocrine system
Hoelscher, B., 1952
Malmejac, J., 1952b, 1952e
effects on kidney
Axelrod, D. R., 1952, 1952a
Selkurt, E. E., 1952
effects on mental performance
Binet, L., 1952, 1952c
effects on metabolism
Branscomb, B. V., 1952
Hemingway, A., 1952a
Lemley, J. M., 1952
effects on muscular system
Gollwitzer-Meier, K., 1952
Hoelscher, B., 1952a
effects on respiration
Åström, A., 1952
Beard, E. F., 1952
Binet, L., 1952a, 1952b
Doyle, J. T., 1952
Dustin, E. H., 1952
Grandpierre, R., 1952e, 1952h
Hall, F. G., 1952a
Hemingway, A., 1952b
Lewis, B. M., 1952, 1952a
Maison, G. L., 1952
Maurath, J., 1952
Nielsen, M., 1952
Rahn, H., 1952
Storstein, O., 1952
effects on standing potential
Burr, H. S., 1952
effects on temperature regulation
Brown, A. L., 1952, 1952a
Hemingway, A., 1952
effects on uterus
Van Liere, E. J., 1952
effects on vision
Benchimol, R., 1952e
Boles Carenini, B., 1952
Brognoli, C., 1952
Cibis, P. A., 1952, 1952a, 1952e
Duguet, J., 1952
Ferraris de Gaspare, P. F., 1952

Anoxia (Continued)
general physiological effects
Grandpierre, R., 1952
Gross, F., 1952
Kimeldorf, D. J., 1952a
Kramer, K., 1952
Lewis, R. B., 1952
Van Liere, E. J., 1952a
relation to drug action
Axelrod, D. R., 1952
Binet, L., 1952a
Crema, A., 1952
Dustin, E. H., 1952
Ferraris de Gaspare, P. F., 1952
Grandpierre, R., 1952b
Maison, G. L., 1952
Tabusse, L., 1952a, 1952c
Venturi, V. M., 1952
tolerance
Binet, L., 1952a
Bugard, 1952
Grandpierre, R., 1952b
treatment
Grandpierre, R., 1952d
Lewis, R. B., 1952
warning devices
Burr, H. S., 1952
Kramer, K., 1952

ANTI-G PROCEDURES (Crouching, Straining, Valsalva maneuver)
Wood, E. H., 1952

ANTI-G SUITS
Anon., 1952d
Conley, M., 1952
Wood, E. H., 1952

ANTIHISTAMINICS, effects on anoxia tolerance
Binet, L., 1952a

ANTISTINE, use in motion sickness
Bénitte, A. C., 1952

ANXIETY
Anon., 1952as, 1952bl
Bitterman, M. E., 1952
Holtzman, W. H., 1952
Schulze, H. A., 1952
effects on psychomotor performance
Price, H. G., 1952

ANXIETY PRONENESS
Holtzman, W. H., 1952
tests
Ulett, G. A., 1952

APNEA
effects on blood oxygen saturation
Grandpierre, R., 1952g
Koolstra, J., 1952
Plas, F., 1952a
effects on circulation
Plas, F., 1952a
in anoxia
Dustin, E. H., 1952
Maison, G. L., 1952

APOMORPHINE, use in motion sickness
Chinn, H. I., 1952d

APTITUDE TESTS
Anon., 1952bt
Cowles, J. T., 1952
Folsom, W. W., 1952
Gordon, M. A., 1952, 1952a, 1952b
Gragg, D. B., 1952
McClanahan, E. C., 1952
Madden, H. L., 1952
Payne, R. B., 1952
Poe, A. C., 1952b
Thorndike, R. L., 1952a
Trumbull, R., 1952, 1952a
Zachert, V., 1952b, 1952e

ARCTIC AEROMEDICAL LABORATORY
Corliss, H. H., 1952

Arterial pressure see Blood pressure

ARTERIOSCLEROSIS, relation to age
Ogle, D. C., 1952

ARTHRITIS, relation to barometric pressure
Jones, H. L., 1952

ARTIFICIAL RESPIRATION
Grandpierre, R., 1952d

Astragalus injuries see Leg injuries
Atheromatosis see Arteriosclerosis
Atmosphere see Planetary atmospheres; Upper atmosphere
Atmospheric pressure see Altitude; Barometric pressure

ATOMIC EXPLOSIONS, effects on vision
Whiteside, T. C. D., 1952a

ATROPINE AND DERIVATIVES
effects on heart
Graettinger, J. S., 1952
vasoconstrictor effects
Lett, J. E., 1952

Attitudes see under Air crews; Aviators; Personnel

AUDITORY ADAPTATION
Zwislocki, J., 1952

AUDITORY FATIGUE
Hirsh, I. J., 1952, 1952a
Rawnsley, A. I., 1952, 1952a
Zwislocki, J., 1952

AUDITORY NERVE, action potentials
Zwislocki, J., 1952

AUDITORY PERCEPTION (see also Auditory adaptation; Auditory fatigue; Loudness discrimination; Pitch discrimination)
Harris, J. D., 1952
Kobrak, H. G., 1952
Pollack, I., 1952
Psycho-Acoustic Lab., 1952, 1952a

Auditory perception (Continued)
in speech communication
Pollack, I., 1952a
Tonndorf, J., 1952
thresholds
Neĭfakh, E. A., 1952
Zwislocki, J., 1952

AUDITORY SIGNALS, intelligibility
Broadbent, D. E., 1952a

AUDITORY STIMULI (see also Noise), idiophonic effect
Flottorp, G., 1952

AUTONOMIC NERVOUS SYSTEM
examination
Lemaire, R., 1952a
relation to motion sickness
Ringenbach, G., 1952

AVIATION CASUALTIES (see also Accidents; Crash injuries), identification
Phillips, R. B., 1952

AVIATION MEDICINE
Anon., 1952ad, 1952aq, 1952bb
Astbury, A. K., 1952
Kendricks, E. J., 1952
Lawton, A. H., 1952
Mendes, M. F., 1952a
Ogle, D. C., 1952
Rusk, H. A., 1952a
Stovall, W. R., 1952a
Strughold, H., 1952a
handbooks
Armstrong, H. G., 1952a
history
Duguet, J., 1952c
McIlnay, O. F., 1952
Olmstedt, J. M. D., 1952
societies
Anon., 1952, 1952c

AVIATION MEDICINE (by country)
(Belgium)
Dambly, 1952
(Brazil)
Mendes, M. F., 1952b
Monteiro, A. R. de Castro, 1952, 1952a
(France)
Placidi, T., 1952
(French West Africa)
Lemaire, R., 1952
(Indochina)
Bouverot, P., 1952
Nardin, 1952
(Sweden)
Åström, A., 1952a
(United States)
Mendes, M. F., 1952d

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AVIATORS (see also Air crews; Pilots)
age factors
Milch, L. J., 1952, 1952a
Packard, J. M., 1952a

Aviators (Continued)
attitudes
Maag, C. H., 1952
classification
Cowles, J. T., 1952
life expectancy
Packard, J. M., 1952b
selection
Anon., 1952bb
Benchimol, R., 1952a, 1952d
Grandpierre, R., 1952g
Sells, S. B., 1952
Tabusse, L., 1952b
Wulfften Palthe, P. M. van, 1952a
training
Evrard, E., 1952c

Bacteria see Salmonella

BAILOUT (see also Ejection seats; Escape capsules; Free fall; Parachute jumping)
Ames, S. W., 1952
Christy, R. L., 1952
Mayo, A. M., 1952b
Rothwell, S., 1952
Wilkes, W. H., 1952

BAILOUT (HIGH ALTITUDE)
Galiana, T. de, 1952
Haber, F., 1952
Henry, J. P., 1952a
Mazza, V., 1952

BAILOUT (HIGH SPEED)
Blanc, E., 1952a
Savely, H. E., 1952
BALLISTOCARDIOGRAPHY
Wittern, W. W. von, 1952

BANTHINE, use in motion sickness
Chinn, H. I., 1952f

BAROMETRIC PRESSURE (see also Altitude)
effects on arthritics
Jones, H. L., 1952
effects on hearing
Neĭfakh, E. A., 1952
effects on skin
Gaul, L. E., 1952

Barotrauma see Aerotitis media
Belts see Safety belts

BENADRYL
psychological effects
Payne, B. A., 1952
use in motion sickness
Bénitte, A. C., 1952
Chinn, H. I., 1952a, 1952d, 1952f
Payne, B. A., 1952
Schwab, R. S., 1952

Bends see Decompression sickness

BENTYL, use in motion sickness
Chinn, H. I., 1952f

Benzedrine see Amphetamine

Binocular vision see Depth perception; Heterophoria; Ocular dominance

BIOGRAPHICAL INVENTORY
DuBois, P. H., 1952

BLAST (see also Wind blast), physiological effects
Cassen, B., 1952, 1952a, 1952b
Graf, K., 1952

BLOOD
carbon dioxide tension
Cannon, J. L., 1952, 1952a
Winterstein, H., 1952a
effects of altitude
Forcher-Mayr, O., 1952
Fryers, G. R., 1952, 1952a
Grognot, P. A., 1952c
Hale, H. B., 1952
Kline, R. F., 1952
Lalli, G., 1952
Lawrence, J. H., 1952
Marshall, L. H., 1952
Redmond, R. F., 1952
Reissmann, K. R., 1952
Schiller, A. A., 1952
Smith, W. W., 1952
Terzioğlu, M. N., 1952, 1952a, 1952b
Vacca, C., 1952
Verzár, F., 1952
effects of anoxia
Arnould, P., 1952
Clark, R. T., 1952
Dreyfus, C., 1952
Maurath, J., 1952
effects of carbon monoxide
Clark, R. T., 1952
effects of cold
Hale, H. B., 1952
effects of cosmic rays
Buettner, K., 1952b
effects of explosive decompression
Kemph, J. P., 1952
effects of high temperature
Malmejac, J., 1952d
effects of hyperoxia
Nahas, G. G., 1952
effects of noise
Hale, H. B., 1952a
effects of ultrasonic vibrations
Grognot, P. A., 1952a
oxygen tension
Biget, P., 1952
Cannon, J. L., 1952
Duke, H. N., 1952
Grandpierre, R., 1952g
Hall, A. L., 1952, 1952b
Koolstra, J., 1952
Kramer, K., 1952
Plas, F., 1952a
Tabusse, L., 1952a, 1952c
relation to age
Milch, L. J., 1952, 1952a

Blood flow see Circulation

BLOOD PRESSURE
effects of airplane flight
Tucci, E. A., 1952
effects of drugs
Brown, B., 1952
Maison, G. L., 1952
Prochnik, G., 1952
effects of pressure breathing
Beck, G. J., 1952
Grandpierre, R., 1952j

BLOOD SUGAR, effects of airplane flight
Lundberg, U., 1952

Blood supply see Circulation

BLOOD VESSELS (see also Carotid)
mechanical properties
Doyle, J. T., 1952a
pathology see Arteriosclerosis

Boats see Lifeboats
Body cavities see Gas in body cavities

BODY FAT
effects of high temperature
Newman, R. W., 1952
effects of physical work
Newman, R. W., 1952

BODY FLUIDS (see also Blood), distribution under acceleration
Gell, C. F., 1952

BODY MEASUREMENTS (see also Foot measurements)
Chardon, 1952
of inhabitants of mountains
Vellard, J., 1952, 1952a
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Morant, G. M., 1952a

BODY WEIGHT, relation to decompression sickness
Cotes, J. E., 1952a

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Opitz, E., 1952a
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Gordon, J. N., 1952
Lucas, B. G. B., 1952
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Cassen, B., 1952b
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Damasio, R., 1952
Grenell, R. G., 1952
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Ulett, G. A., 1952
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Foitzik, L., 1952
Morgan, C. T., 1952

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Choy, D. S. J., 1952

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DeHaven, H., 1952
Graham, F., 1952
MacCarty, E. S., 1952
Peterson, V. A., 1952
Shaw, W. C., 1952

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CARBON DIOXIDE (see also Alveolar carbon dioxide tension; Hypercapnia; see also Carbon dioxide tension under Blood)
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Schaefer, K. E., 1952a
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Wing, K. G., 1952
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Whitehorn, W., 1952
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Åström, A., 1952
Nielsen, M., 1952
Schaefer, K. E., 1952
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White, C. S., 1952

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Branscomb, B. V., 1952

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Clark, R. T., 1952
Duke, H. N., 1952

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Comstock, C. C., 1952

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Feinstein, R. N., 1952

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Packard, J. M., 1952a

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Prochnik, G., 1952

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Hendler, E., 1952

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Pierce, T. F., 1952

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Duane, T. D., 1952, 1952a, 1952b
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Cannon, J. L., 1952a
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CHEMORECEPTORS, stimulation by carbon monoxide
Duke, H. N., 1952

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Deschwanden, J. von, 1952
Girling, F., 1952
Jungmann, H., 1952
Marbarger, J. P., 1952
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Beard, E. F., 1952, 1952a
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Lewis, B. M., 1952a
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Plas, F., 1952a
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Kemph, J. P., 1952
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Balke, B., 1952
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Grandpierre, R., 1952a, 1952c
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Edelberg, R., 1952
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Henry, J. P., 1952

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Lawrence, M., 1952
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Zwislocki, J., 1952a

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Fitts, P. M., 1952
King, B. G., 1952
Schmidt, L., 1952
Stieglitz, W. I., 1952

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Gross, F., 1952, 1952a
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Hale, H. B., 1952
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Brown, A. L., 1952, 1952a
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Hemingway, A., 1952a
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Bartlett, D. J., 1952
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Kimeldorf, D. J., 1952, 1952b
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Hsia, Y., 1952
Sexton, M. S., 1952

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Berg, P., 1952

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Alexander, L., 1952

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Broadbent, D. E., 1952

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Duguet, J., 1952b
McGraw, J. L., 1952

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CONTROL KNOBS, human engineering
Biel, W. C., 1952

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Evans, T. C., 1952
Gaspa, P. H., 1952a
Muller, H. J., 1952
Schaefer, H. J., 1952, 1952a, 1952b, 1952c
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Krebs, A. T., 1952a

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Crash Injury Res., 1952
Morais, C., 1952
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Anon., 1952i,
Baldes, E. J., 1952
Crash Injury Res., 1952a
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Guilbert, E. A., 1952
MacPherson, A. E., 1952
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Pernet, A., 1952

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Higginbotham, A. C., 1952

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DARK ADAPTATION (see also Retinal adaptation)
Brown, J. L., 1952, 1952a
Diamond, A. L., 1952
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Plant, W. H., 1952
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Benchimol, R., 1952e
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Brown, K. T., 1952
McLaughlir, S. C., 1952
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Hsia, Y., 1952

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Guild, S. R., 1952a
Harris, J. D., 1952
Tonndorf, J., 1952c

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Cotes, J. E., 1952, 1952a
Hall, A. L., 1952c
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Boothby, W. M., 1952

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Smith, W. M., 1952
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Cibis, P. A., 1952
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Cibis, P. A., 1952
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Rose, H. W., 1952
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Chinn, H. I., 1952a

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Dustin, E. H., 1952

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Chinn, H. I., 1952f

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Jackson, M. M., 1952
Steggerda, F. R., 1952, 1952a, 1952b

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Evrard, E., 1952a, 1952d
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Drugs (Continued)
Mosidal, Multergan, Nautamine, Nicotinic acid, Nitrites, Parsidol, Phenergan, Pilocarpine, Postaphene, Probanthine, Procaine, Promethazine, Pyrrolazote, Salyrgan, Scopolamine, Scopodex, Sodium azide, Sulfonamide compounds, Theophorine, Trimeton, Vasopressin, Vomex A)
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Bauer, R. O., 1952a
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Venturi, V. M., 1952
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Brown, B., 1952
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Anson, B. J., 1952
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Anson, B. J., 1952

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Strong, H. L., 1952

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Ingalls, T. H., 1952

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McIntyre, E., 1952

ENDOCRINE SYSTEM (see also Adrenal glands; Hypophysis; Thyroid gland)
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Hoelscher, B., 1952

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Flückiger, E., 1952

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Anon., 1952o
Meyer, A. F., 1952
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Gierke, H. E. von, 1952a
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Lett, J. E., 1952

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Burch, B. H., 1952
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Cole, C. H., 1952
Edelmann, A., 1952
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Wiesinger, K., 1952
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Anon., 1952ai
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Cunha, R., 1952

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Harrold, M. C., 1952

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Steggerda, F. R., 1952, 1952b

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Simonson, E., 1952, 1952a

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Anon., 1952bl
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Lundberg, U., 1952a
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Mendes, M. F., 1952
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Mahler, W. R., 1952
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FOOD, preservation
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Gerathewohl, S. J., 1952c
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Sleight, R. B., 1952a

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Frankl, V. E., 1952

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GAS IN BODY CAVITIES (see also Flatus; Pneumothorax), effects on air transportability
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HEARING (see also Auditory perception; Bone conduction; Cochlea, physiology; Deafness; Electrophonic hearing)
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Graf, K., 1952
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Gallagher, J. B., 1952
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Buettner, K., 1952, 1952a
Campbell, P. A., 1952
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Daley, E. A., 1952
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Frykholm, A., 1952

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Tufts Exper. Psychol., 1952

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Gaul, L. E., 1952

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Burr, H. S., 1952

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Brozek, J., 1952
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Cohen, J., 1952

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Marshall, L. H., 1952
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Graybiel, A., 1952a
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Aschan, G., 1952
Clark, B., 1952b
Graybiel, A., 1952
Mann, C. W., 1952, 1952d
effects of subgravity
Henry, J. P., 1952
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Graybiel, A., 1952c, 1952d
Larsson, L. J., 1952
Worchel, P., 1952

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LEADERSHIP
Moore, J. V., 1952

LEARNING (see also Training)
Bilodeau, E. A., 1952b
Pollack, I., 1952b, 1952c, 1952d, 1952e
Reynolds, B., 1952, 1952a

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Coltart, W. D., 1952

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Legibility see under Letters and Numerals
Lenses see Contact lenses

LERGIGAN, use in motion sickness
Chinn, H. I., 1952, 1952a, 1952c, 1952d, 1952f
Schwab, R. S., 1952

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Crook, M. N., 1952
Long, E. R., 1952, 1952a

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Life expectancy see Aviators, life expectancy

LIFE RAFTS, color
Anon., 1952be
Berg, P., 1952

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LIGHT STIMULI
effects on brain waves
Ulett, G. A., 1952
Wulfften Palthe, P. M. van, 1952b
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Verplanck, W. S., 1952
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Guedry, F. E., 1952

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LISERGAN, use in motion sickness
Bénitte, A. C., 1952
Chinn, H. I., 1952f

LIVER, effects of altitude
Gaspa, P. H., 1952

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LOUDNESS DISCRIMINATION
Pollack, I., 1952, 1952a
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Brogan, F. A., 1952

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LUNG (see also Alveolar carbon dioxide tension; Pulmonary circulation; Respiration)
effects of anoxia
Grandpierre, R., 1952h
Hemingway, A., 1952b
effects of blast
Cassen, B., 1952a, 1952b
effects of explosive decompression
Grognot, P. A., 1952b
Marks, G., 1952
Vail, E. G., 1952, 1952a
Violette, F., 1952
effects of hyperoxia
Bean, J. W., 1952a, 1952h
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Boura, M., 1952
Tabusse, L., 1952
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Downey, V. M., 1952

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Besnard, G. G., 1952
Hill, J. H., 1952
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Green, D. E., 1952
Hill, J. H., 1952a
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Hill, J. H., 1952, 1952a

Manipulation tests see Neuromuscular performance, tests

MARS, life conditions
Strughold, H., 1952

Measurements see Body measurements
Mechanics (Personnel) see Maintenance personnel

MEDICAL ATTENDANTS, training
Donneson, A. J., 1952
Strickland, B. A., 1952

Medical examination see Neuropsychiatric examination; Physical examination

MEDICAL PERSONNEL (see also Flight nurses; Flight surgeons; Medical attendants; Psychiatrists)
air transportation
Anon., 1952j
France
Bijout, R., 1952

MENTAL ABILITY
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Clements, R., 1952

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Guilford, J. P., 1952
Tupes, E. C., 1952c
Wulfften Palthe, P. M. van, 1952c

MENTAL DISEASES, effects on air transportability
Strickland, B. A., 1952a

MENTAL STRESS, effects on psychomotor performance
Deese, J., 1952

MENTAL WORK
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Binet, L., 1952, 1952c
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Binet, L., 1952, 1952c

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Pollack, I., 1952b, 1952c, 1952d, 1952e

Metabolism see Effects on metabolism under Anoxia and Cold

METEORITES
Whipple, F. L., 1952

Middle ear, pathology see Aerotitis media
Moisture see Humidity

MOSIDAL, use in motion sickness
Chinn, H. I., 1952f

Morale see Instructors, morale

MOTION SICKNESS
Anon., 1952ab
Allard, A., 1952a
Alvarez, W. C., 1952
Bénitte, A. C., 1952, 1952a
Biget, P. L., 1952
Chinn, H. I., 1952, 1952a, 1952b, 1952c, 1952d, 1952e, 1952f
Dhiraputra, S., 1952
Diamant, H., 1952
Evrard, E., 1952a, 1952d
Glaser, E. M., 1952
Handford, S. W., 1952
Johnson, W. H., 1952, 1952a
Payne, B. A., 1952
Ringenbach, G., 1952
Rudat, W., 1952
Schwab, R. S., 1952
Wang, S. C., 1952
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Johnson, W. H., 1952
Lansberg, M. P., 1952

MULTERGAN, use in motion sickness
Chinn, H. I., 1952f

MUSCLE TISSUE, composition
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Clark, R. T., 1952a
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Clark, R. T., 1952a

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MUSCULAR SYSTEM (see also Neuromuscular performance; Neuromuscular reactions)
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Schaefer, K. E., 1952a
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Gollwitzer-Meier, K., 1952
Hoelscher, B., 1952a
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Schaefer, K. E., 1952a
effects of cold
Hoelscher, B., 1952a
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Gerstner, H. B., 1952

MYOCARDIAC TISSUE
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Lemley, J. M., 1952
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Lemley, J. M., 1952

NASAL PASSAGES, congestion
effects of ephedrine
Lett, J. E., 1952

NAUTAMINE, use in motion sickness
Bénitte, A. C., 1952
Biget, P. L., 1952
Evrard, E., 1952a, 1952d

Nervous system see Auditory nerve; Autonomic nervous system; Brain; Conditioned reflexes; Neuromuscular performance; Neuromuscular reactions

NEUROMUSCULAR PERFORMANCE (see also Psychomotor performance; Reaction time)
effects of cold
Bartlett, D. J., 1952
McCleary, R. A., 1952
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Ballinger, E. R., 1952
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Bilodeau, E. A., 1952d
Reynolds, J. B., 1952
Thompson, M. E., 1952

NEUROMUSCULAR REACTIONS, in hyperoxia
Bean, J. W., 1952

NEUROPSYCHIATRIC EXAMINATION (see also Mental ability, tests)
Allard, A., 1952
Anastasi, A., 1952
Bitterman, M. E., 1952
Duncombe, A., 1952
Malmejac, J., 1952a
Sells, S. B., 1952
Symonds, C., 1952

NEUROSES (see also Anxiety)
Bond, D. D., 1952
Symonds, C., 1952

Nicotine see Tobacco

NICOTINIC ACID, effects on vision
Brognoli, C., 1952

NIGHT VISION (see also Retinal adaptation)
Beyne, J., 1952a
Cibis, P. A., 1952a, 1952e
Gulley, W. E., 1952
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Plant, W. H., 1952
relation to peripheral vision
Groot, S. G. de, 1952
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Rose, H. W., 1952b

NITRITES (Amyl nitrite), effects on vision
Brognoli, C., 1952

NITROGEN ELIMINATION
Boothby, W. M., 1952, 1952a

NOISE (see also Airplane noise; Auditory stimuli; Engine noise)
Bolt, R. H., 1952
Pollack, I., 1952
effects on blood
Hale, H. B., 1952a
effects on cochlea
Covell, W. P., 1952
Guild, S. R., 1952, 1952a
Tonndorf, J., 1952a, 1952b
Zwislocki, J., 1952
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Fox, M. S., 1952
Gallagher, J. B., 1952
Glorig, A., 1952
Guild, S. R., 1952a
Hirsh, I. J., 1952, 1952a
Kobrak, H. G., 1952
Tonndorf, J., 1952, 1952c
Zwislocki, J., 1952
effects on speech communication
Kryter, K. D., 1952
Tonndorf, J., 1952
effects on vision
Broussard, I. G., 1952
general physiological effects
Hubbard, H. H., 1952a
Kryter, K. D., 1952a
Moles, A., 1952
psychological effects
Kryter, K. D., 1952a
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Bolt, R. H., 1952
Hubbard, H. H., 1952a
Moles, A., 1952
tolerance
Lett, J. E., 1952a
Sterner, J. H., 1952, 1952a

NONCOMMISSIONED OFFICERS, rating
Moore, J. V., 1952

NUCLEAR RADIATIONS, biological effects
Talbot, J. M., 1952

NUMERALS, legibility
Aeronaut. Med. Equip. Lab., 1952
Schapiro, H. B., 1952

Nurses see Flight nurses
Nutrition see Air crews, nutrition; Flight feeding; Food

NYSTAGMUS after rotation
Sala, O., 1952

Occupational diseases see under Personnel; Pilots

OCULAR DOMINANCE, reviews
Gilinsky, A. S., 1952

Oculogravic illusion see Visual illusions
Oculogyral illusion see Visual illusions
Odors see Deodorization

OFFICERS
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Folsom, W. W., 1952
McClanahan, E. C., 1952
Tupes, E. C., 1952a, 1952b, 1952c, 1952d
Zachert, V., 1952a
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Tupes, E. C., 1952d

OPTICAL FILTERS
Wilson, M. R., 1952

Optical illusions see Visual illusions
Orientation see Spatial orientation; Topographical orientation

OXYGEN (see also Anoxia; Hyperoxia; Ozone)
effects on altitude tolerance
Girling, F., 1952
Marbarger, J. P., 1952
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Boles Carenini, B., 1952
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Boothby, W. M., 1952, 1952a
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Maurath, J., 1952
Storstein, O., 1952
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Cannon, J. L., 1952a
Grandpierre, R., 1952

OXYGEN CONSUMPTION in anoxia
Branscomb, B. V., 1952

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OXYGEN EQUIPMENT
Bedwell, M. E., 1952, 1952a
Dietz, W. C., 1952
Hall, A. L., 1952d
Lombard, C. F., 1952a
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Lund, P., 1952
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Ames, S. W., 1952
Comfort, E., 1952
Döbeln, W. von, 1952
Middleton, R. H., 1952

Oxygen poisoning see Hyperoxia
Oxygen tension see under Blood

OZONE, toxic effects
Regener, V. H., 1952

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PARABIOSIS
Hoelscher, B., 1952

PARACHUTE HARNESSES
Naval Air Test, 1952

PARACHUTE JUMPING
Gross, F., 1952
Kerr, T. H., 1952
Santos, F. R. dos, 1952
Strong, H. L., 1952

Paradoxical effects see Oxygen, paradoxical effects

PARSIDOL, use in motion sickness
Chinn, H. I., 1952f

PASSENGER TRANSPORTATION (see also Air transportation of patients)
safety
Graham, F., 1952
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Guimaraes, G., 1952

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PEDALS, human engineering
Martin, W. B., 1952

Perception see Auditory perception; Depth perception; Proprioception; Tactile perception; Visual perception
Performance see Neuromuscular performance; Psychomotor performance; see also Performance under Air crews; Instructors; Maintenance personnel; Pilots

PERIPHERAL VISION, relation to night vision
Groot, S. G. de, 1952

Personality see Leadership; see also under Instructors and Pilots

PERSONALITY TESTS
Alexander, L., 1952
Bair, J. T., 1952a
Tupes, E. C., 1952, 1952a

PERSONNEL (see also Aviators; Instructors; Maintenance personnel; Medical personnel; Noncommissioned officers; Officers; Traffic control operators)
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Ogle, D. C., 1952
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Bair, J. T., 1952b
Berkeley, M. H., 1952
Hollander, E. P., 1952
Tupes, E. C., 1952e
Zachert, V., 1952c
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Abt, J. C., 1952
Christal, R. E., 1952
DuBois, P. H., 1952

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Gordon, M. A., 1952, 1952a, 1952b
Gragg, D. B., 1952
Guilford, J. P., 1952
Howard, J. K., 1952
Lecznar, W. B., 1952
Madden, H. L., 1952
Pickrel, E. W., 1952
Reynolds, J. B., 1952
Rupe, J. C., 1952
Thorndike, R. L., 1952, 1952a
Tiedeman, D. V., 1952
Zaccaria, L., 1952
Zachert, V., 1952, 1952b, 1952c, 1952d, 1952e
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Cunha, R., 1952
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Conybeare, Sir J., 1952
Jones, W. L., 1952
occupational diseases
Durante, U., 1952
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Lucas, J. D., 1952
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Adams, M. M., 1952
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Anastasi, A., 1952
Bair, J. T., 1952
Chardon, 1952
Daley, E. A., 1952
Duncombe, A., 1952
Hollander, E. P., 1952a
Jones, W. L., 1952
Lecznar, W. B., 1952
Pickrel, E. W., 1952
Trumbull, R., 1952, 1952a
Tupes, E. C., 1952, 1952e
Zimmer, C. E., 1952
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Bair, J. T., 1952
Beals, L. S., 1952a
Gibson, E. J., 1952
Gulley, W. E., 1952
Hollander, E. P., 1952, 1952a
Wells, J. G., 1952

PERSPIRATION
Peiss, C. N., 1952

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PHENERGAN, use in motion sickness
Bénitte, A. C., 1952
Chinn, H. I., 1952, 1952a, 1952c, 1952e
Glaser, E. M., 1952
Schwab, R. S., 1952

Phobias see Anxiety
Phorometry see Heterophoria, test methods

PHYSICAL EXAMINATION (see also Examination under Cardiovascular system; Eye; Heart)
Malmejac, J., 1952a
Packard, J. M., 1952a
Wulfften Palthe, P. M. van, 1952a

PHYSICAL EXERCISE (see also Sport activities)
effects on blood
Forcher-Mayr, O., 1952
effects on body fat
Newman, R. W., 1952
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Balke, B., 1952
Welch, G. E., 1952
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Clark, R. T., 1952a
Vacca, C., 1952
effects on respiration
Balke, B., 1952
Welch, G. E., 1952
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Evrard, E., 1952c

PHYSICAL FITNESS
Conybear, Sir J., 1952
Weeren, J. T. van, 1952
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E., E., 1952
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Lundberg, U., 1952a
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Evrard, E., 1952, 1952b
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Anon., 1952bn, 1952bo
Bur. Safety Invest., 1952c, 1952d, 1952e, 1952f
Heyl, E. B., 1952
McFarland, R. A., 1952
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Mendes, M. F., 1952c
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Bergeret, P., 1952
Bjuggren, B., 1952
Erdbrink, W. L., 1952
Mahler, W. R., 1952
Milton, J. L., 1952
Rusk, H. A., 1952
Stovall, W. R., 1952
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Ericksen, S. C., 1952a
McIntosh, B. B., 1952
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Erdbrink, W. L., 1952
Frykholm, A., 1952a
Numeroso, N., 1952
Wulfften Palthe, P. M. van, 1952
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Bair, J. T., 1952b
Benchimol, R., 1952c
Clark, B., 1952d
Ericksen, S. C., 1952
Hollander, E. P., 1952b
LeHalle, P., 1952
Payne, R. B., 1952

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Pera, G., 1952
Placidi, T., 1952
Poe, A. C., 1952b
Zaccaria, L., 1952, 1952a
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Allard, A., 1952
Barch, A. M., 1952
Bilodeau, E. A., 1952
Clark, B., 1952d
Dambly, 1952
Ganguly, K. K., 1952
Hollander, E. P., 1952b
Krumm, R. L., 1952
Poe, A. C., 1952, 1952a
Zaccaria, L., 1952a
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Adiseshiah, W. T. V., 1952

PITCH DISCRIMINATION
Harris, J. D., 1952a, 1952b

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PLANETARY ATMOSPHERES
Strughold, H., 1952

Planets see Mars; Venus

PLASTIC SURGERY
Pernet, A., 1952

PNEUMOTHORAX, effects on air transportability
Anon., 1952aj

POISONOUS SUBSTANCES (see also substances listed under Toxic effects), research
Schreuder, O. B., 1952

POLIOMYELITIS, effects on air transportability
Hunley, H. C., 1952

Position see Posture; Prone position flight; Supine position flight

POSTAFENE, use in motion sickness
Chinn, H. I., 1952e, 1952f

POSTDECOMPRESSION SHOCK
Rait, W. L., 1952

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effects on acceleration tolerance
Mayo, A. M., 1952
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Graettinger, J. S., 1952
Luria, L., 1952

Potentials see Standing potential; see Action potentials under Auditory nerve; Cochlea; Muscular system
Pressure see Barometric pressure; Blood pressure; Intracranial pressure; Tissue pressure

PRESSURE BREATHING
Lewis, R. B., 1952
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Beck, G. J., 1952
Grandpierre, R., 1952a, 1952c, 1952j
Hall, A. L., 1952b
Mahoney, D. I., 1952
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Grandpierre, R., 1952a, 1952c
Hall, A. L., 1952a

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Dietz, W. C., 1952
Hull, W. E., 1952a
Lederer, L., 1952

Pressure suits see Altitude suits; Anti-g suits

PROBANTHINE, use in motion sickness
Chinn, H. I., 1952f

PROCAINE AND DERIVATIVES, effects on anoxia tolerance
Grandpierre, R., 1952b

PROMETHAZINE, use in motion sickness
Glaser, E. M., 1952

PRONE POSITION FLIGHT
Schmidt, L., 1952
effects on acceleration tolerance
Anderton, D. A., 1952
Hermann, F. von, 1952
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Anon., 1952au
Emerson, G. O., 1952

Proneness see Accident proneness; Anxiety proneness; Motion sickness, predisposition

PROPRIOCEPTION
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Boring, R. O., 1952
Mann, C. W., 1952a, 1952b, 1952c
Thetford, P. E., 1952
Wapner, S., 1952
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Howland, D., 1952

PROTECTIVE EQUIPMENT (see also Altitude suits; Anti-g suits; Boots; Contact lenses; Harnesses; Helmets; Life rafts; Oxygen equipment; Safety belts; Spectacles; Sunglasses; Warning devices)
Blount, R. H., 1952
Crash Injury Res., 1952a
Jones, W. L., 1952
Marcks, C. A., 1952
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Anon., 1952br

Psychiatric examination see Neuropsychiatric examination

PSYCHIATRISTS, duties
Bond, D. D., 1952

Psychological effects see under Combat stress; Flight duty; Free fall; Jet plane flight; Noise; Supersonic flight; Wind. See also under Amphetamine; Benadryl; Dramamine; Scopolamine.
Psychological examination see Mental ability, tests
Psychological factors see under Depth perception; Physical fitness; Pilots, training; Psychomotor performance; Spatial orientation; Vigilance; Visual perception

PSYCHOMOTOR PERFORMANCE (see also Neuromuscular performance; Reaction time; Target tracking)
Adiseshiah, W. T. V., 1952
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Frederick, W. R., 1952
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Deese, J., 1952
Price, H. G., 1952
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Duncan, C. P., 1952
Grice, G. R., 1952
Reynolds, B., 1952
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Bilodeau, E. A., 1952, 1952b, 1952c
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Bilodeau, E. A., 1952e
Duncan, C. P., 1952
Grice, G. R., 1952
Jones, E. I., 1952

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PULMONARY CIRCULATION
Doyle, J. T., 1952a
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Aviado, D. M., 1952, 1952a
Doyle, J. T., 1952
Lewis, B. M., 1952
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Plas, F., 1952a
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Luria, L., 1952
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Welch, G. E., 1952

PUPILLARY REACTIONS in anoxia
Duguet, J., 1952

PYRROLAZOTE, use in motion sickness
Chinn, H. I., 1952e, 1952f

RADAR OPERATION
Bowen, H. M., 1952
Brown, J. L., 1952b
Christal, R. E., 1952
Gerathewohl, S. J., 1952a
Herrick, R. M., 1952
Morgan, C. T., 1952
Senders, J. W., 1952

RADAR SIGNALS, intelligibility
Bowen, H. M., 1952a

Radiations see Ionizing radiation; Solar radiation
Rafts see Life rafts

Range finding see Depth perception
Rating see under Instructors; Maintenance personnel; Noncommissioned officers; Personnel

REACTION TIME
Frykholm, A., 1952
Spencer, J., 1952
Stump, N. E., 1952

Reflexes see Conditioned reflexes

REFRACTOMETRY
Wilson, M. R., 1952a

Reproduction see Fertility
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RESCUE ON WATER
Anon., 1952aw
Sexton, M. S., 1952

RESPIRATION (see also Apnea; Artificial respiration; Hyperpnea; Pressure breathing)
effects of acceleration
Duane, T. D., 1952, 1952b
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Rahn, H., 1952
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Åström, A., 1952
Beard, E. F., 1952
Binet, L., 1952a
Grandpierre, R., 1952e
Hall, F. G., 1952a
Maurath, J., 1952
Nielsen, M., 1952
Rahn, H., 1952
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Åström, A., 1952
Schaefer, K. E., 1952
Tabusse, L., 1952b
White, C. S., 1952
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Binet, L., 1952a
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Balke, B., 1952
Welch, G. E., 1952
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Grandpierre, R., 1952a, 1952c
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Boothby, W. M., 1952a

RESPIRATORY DISEASES, effects on air transportability
Smedal, H. A., 1952

Respiratory system see Lung; Nasal passages
Retention see Messages, retention; see also Retention of training under Psychomotor performance
Retina see Altitude acclimatization, effects on retina

RETINAL ADAPTATION (see also Dark adaptation; Night vision)
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Cibis, P. A., 1952a, 1952e
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Cibis, P. A., 1952c

Retinal adaptation (Continued)
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Cibis, P. A., 1952a, 1952e
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Brown, J. L., 1952b
Herrick, R. M., 1952
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Gumbel, E. J., 1952
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Rose, H. W., 1952a

RETINAL CIRCULATION, effects of anoxia
Huerkamp, B., 1952
Opitz, E., 1952

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ROCKET FLIGHT, physiological effects
Anon., 1952al, 1952w
Gatland, K. W., 1952

ROCKET PROPELLANTS (see also Hydrazine)
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Harrold, M. C., 1952
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Owston, J., 1952

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Edelberg, R., 1952
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Aschan, G., 1952
Clark, B., 1952b
Graybiel, A., 1952
Guedry, F. E., 1952, 1952a
Mann, C. W., 1952, 1952d
Sala, O., 1952

Safety see Protective equipment; see also under Air transportation of patients; Airplane flight; Passenger transportation

SAFETY BELTS
Anon., 1952i, 1952t
DuBois, E. F., 1952

SALMONELLA
Berry, L. J., 1952a, 1952b

SALYRGAN, effects on kidney
Axelrod, D. R., 1952

Sanitation see under Airplanes and Water supply; see Air purification; Passenger transportation, sanitary aspects
Satellites see Space stations

SCARLET FEVER
Sellers, A. H., 1952a

SCOPODEX, use in motion sickness
Chinn, H. I., 1952a

SCOPOLAMINE (Hyoscine)
psychological effects
Payne, B. A., 1952
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Anon., 1952ab
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Glaser, E. M., 1952
Payne, B. A., 1952

Sea rescue see Rescue on water

SEALED CABINS, human engineering
Clamann, H. G., 1952

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SEATS (see also Ejection seats)
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DeHaven, H., 1952a
Guilbert, E. A., 1952
McSurely, A., 1952
Martin, W. B., 1952

Selection see under Aviators; Maintenance personnel; Officers; Personnel; Pilots; Traffic control operators
Semicircular canals see Labyrinth
Sense organs see Ear; Eye; Chemoreceptors
Sensorimotor performance see Psychomotor performance

SENSORY ILLUSIONS (see also Visual illusions), relation to spatial orientation
Anon., 1952bg

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Serum see Blood
Shape perception see Form perception
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SIGNAL LIGHTS, visibility
Gerathewohl, S. J., 1952b

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SKIN (see also Cutaneous circulation; Perspiration)
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Gaul, L. E., 1952
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Malmejac, J., 1952d
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Peiss, C. N., 1952

Smoking see Tobacco
Societies see Aviation medicine, societies

SODIUM AZIDE, effects on cochlea
Tonndorf, J., 1952b

SOLAR RADIATION, effects on digestive system
Cordier, D., 1952

Sound see After-sound; Noise
Soundproofing see Reduction under Airplane noise, Engine noise, and Noise

SPACE FLIGHT, medical problems
Barron, C. I., 1952
Bauer, L. H., 1952
Benchimol, R., 1952b
Campbell, P. A., 1952a

Space flight, medical problems (Continued)
Haber, F., 1952
Haber, H., 1952, 1952a, 1952b, 1952c, 1952d, 1952g, 1952i
Lo Monaco Croce, T., 1952
Putt, D. L., 1952a
Strughold, H., 1952a, 1952c
Thompson, L. N., 1952
Whipple, F. L., 1952
White, C. S., 1952a

SPACE STATIONS (Satellites), human engineering
Ley, W., 1952

SPATIAL ORIENTATION
in acceleration
Witkin, H. A., 1952
in high altitude flight
Campbell, P. A., 1952
in instrument flight
Anon., 1952bg
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Ballinger, E. R., 1952
Gerathewohl, S. J., 1952
Thompson, L. N., 1952
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Mann, C. W., 1952c
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Graybiel, A., 1952c, 1952d
Larsson, L. J., 1952
Worchel, P., 1952
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Boring, R. O., 1952
Gibson, J. J., 1952, 1952a
Mann, C. W., 1952a, 1952b, 1952c
Thetford, P. E., 1952
Wapner, S., 1952

SPEAKING (see also Speech)
physiological effects
Black, J. W., 1952
Hall, F. G., 1952
physiological factors
Atkinson, C. J., 1952
Black, J. W., 1952

SPECTACLES (Eyeglasses) (see also Sunglasses)
Gulley, W. E., 1952a

SPEECH (see also Jaw movements in speech; Speaking)
intelligibility
Atkinson, C. J., 1952a
Hansen, R. G., 1952
Kryter, K. D., 1952
Tonndorf, J., 1952
loudness
Pollack, I., 1952a

SPINE INJURIES
Achiary, 1952
Nicolas, 1952

SPORT ACTIVITIES
Ganguly, K. K., 1952

STANDING POTENTIAL in anoxia
Burr, H. S., 1952

Stereoscopic vision see Depth perception
Sterility see Fertility
Stimuli see Auditory stimuli; Light stimuli
Straining see Anti-g procedures

STRESS (see also Acceleration; Anoxia; Combat stress; Mental stress; Physical exercise), effects on performance
Anon., 1952bd
Deese, J., 1952

STRETCHERS
Hebraud, A., 1952

SUBGRAVITY
effects on spatial orientation
Ballinger, E. R., 1952
Gerathewohl, S. J., 1952
general physiological effects
Anderton, D. A., 1952
Henry, J. P., 1952
Thompson, L. N., 1952
research
Anon., 1952al, 1952w
Gatland, K. W., 1952
Haber, F., 1952b, 1952e

Sugar see Blood sugar
Suits see Altitude suits; Anti-g suits

SULFONAMIDE COMPOUNDS, toxic effects in anoxia
Crema, A., 1952

SUNGLASSES (see also Spectacles)
Byrnes, V. A., 1952a
Naval Med. Res. Lab., 1952

Sunshine see Solar radiation

SUPERSONIC FLIGHT
medical problems
Anon., 1952bh
Benchimol, R., 1952b
Blanc, E., 1952a
Frykholm, A., 1952
Sebas, R., 1952
psychological effects
Anon., 1952bh

Supersonic vibrations see Ultrasonic vibrations

SUPINE POSITION FLIGHT, effects on acceleration tolerance
Ballinger, E. R., 1952

Surgeons see Flight surgeons
Surgery see Parabiosis; Plastic surgery

SURVIVAL
in the air (see also Bailout)
Anon., 1952br
in the Arctic
Anon., 1952av, 1952br
Air Force, 1952a
on land
Air Force, 1952a
Rodewald, F. A., 1952
Wilcox, M., 1952

Survival (Continued)
on water
Anon., 1952br
Air Force, 1952a
Hall, A. L., 1952d
Rodewald, F. A., 1952

Sweating see Perspiration

SWITCHES, human engineering
Stump, N. E., 1952

Sympathetic nervous system see Autonomic nervous system

TACTILE PERCEPTION
Biel, W. C., 1952
effects of cold
Bartlett, D. J., 1952

Talus injuries see Leg injuries

TARGET IDENTIFICATION
Broussard, I. G., 1952
Gerathewohl, S. J., 1952c

TARGET TRACKING (see also Psychomotor performance)
Barch, A. M., 1952
Bilodeau, E. A., 1952a, 1952c, 1952e
Deese, J., 1952
Grice, G. R., 1952
Krendel, E. S., 1952, 1952a
Lincoln, R. S., 1952
Price, H. G., 1952
Senders, J. W., 1952
training devices
Warren, C. E., 1952, 1952a

TARGETS, visibility
Foltzik, L., 1952

Teeth see Dental care; Dental disturbances; Tooth fillings

TEMPERATURE (see also Cold; High temperature)
effects on altitude tolerance
Bauer, R. O., 1952a

TEMPERATURE REGULATION (see also Heat loss)
effects of anoxia
Brown, A. L., 1952, 1952a
Hemingway, A., 1952
effects of altitude
Flückiger, E., 1952

Tests see Achievement tests; Aptitude tests; see also Tests and Test methods under objects and conditions tested

TETRAETHYL PYROPHOSPHATE
effects on altitude tolerance
Bauer, R. O., 1952a
toxic effects
Sullivan, R. R., 1952

THEPHORINE, use in motion sickness
Biget, P. L., 1952

THIAMINE, effects on altitude tolerance
Fortier, G., 1952

THYROID GLAND, relation to altitude acclimatization
Verzár, F., 1952a

TIME RESERVE
Haber, F., 1952a
Hall, A. L., 1952
Luft, U. C., 1952a

TISSUE PRESSURE in explosive decompression
Kemph, J. P., 1952a

TISSUE (see also Muscle tissue; Myocardiac tissue)
effects of altitude
Cullumbine, H., 1952
effects of vibration
Gierke, H. E. von, 1952

TOBACCO (Nicotine, Smoking)
effects on physical fitness
E., E., 1952
effects on vision
Ferraris de Gaspare, P. F., 1952

TOOTH FILLINGS
Hester, W. R., 1952

TOPOGRAPHICAL ORIENTATION
Clark, B., 1952a, 1952c

Touch see Tactile perception
Toxic effects see under Aircraft brighteners; Carbon tetrachloride; Deodorants; Fire extinguishing agents; Gasoline; Hydrazine; Jet fuels; Kerosene; Ozone; Rocket propellants; Sulfonamide compounds; Tetraethyl pyrophosphate; Tricresylphosphate
Tracking see Target tracking

TRAFFIC CONTROL OPERATORS, selection
Abt, J. C., 1952

Training see Learning; see as subdivision under Air crews; Flight nurses; Flight surgeons; Medical attendants; Officers; Personnel; Pilots
Training devices see under Target tracking
Transfer of training see under Psychomotor performance
Transportation see Air transportation of patients; Medical personnel, air transportation; Passenger transportation; Stretchers

TRICRESYLPHOSPHATE, toxic effects
Jordi, A. U., 1952

TRIMETON, use in motion sickness
Chinn, H. I., 1952a, 1952c, 1952e, 1952f

ULTRASONIC VIBRATIONS, physiological effects
Grognot, P. A., 1952, 1952a
Parrack, H. O., 1952, 1952a

ULTRAVIOLET RAYS, physiological effects
Burnright, T. R., 1952

UPPER ATMOSPHERE, research
Mitra, S. K., 1952

Urinary system see Kidney

UTERUS, effects of anoxia
Van Liere, E. J., 1952

Valsalva maneuver see Anti-g procedures

VASOPRESSIN (Pitressin), effects on circulation
Maison, G. L., 1952

VENTILATION
Peterson, V. A., 1952

Venous pressure see Blood pressure

VENUS, life conditions
Strughold, H., 1952

Vertebrae see Spine injuries
Vessels see Blood vessels
Vestibule see Labyrinth

VIBRATION (see also Bone conduction; Ultrasonic vibrations), physiological effects
Bugard, P. J., 1952
Gierke, H. E. von, 1952, 1952b
Goldman, D. E., 1952, 1952a
Guillemin, V., 1952
Off. Tech. Services, 1952

VIGILANCE (see also Alertness), psychological factors
Broadbent, D. E., 1952

Visibility see under Colors; Signal lights; Targets

VISION (see also Color vision; Eye; Heterophoria; Ocular dominance; Peripheral vision; Retinal adaptation; Visual accommodation; Visual acuity; Visual perception)
effects of anoxia
Brognoli, C., 1952
effects of contact lenses
Duguet, J., 1952b
effects of drugs
Brognoli, C., 1952
test methods (see also Refractometry)
Anon., 1952ar
Armed Forces-NRC Vision Comm., 1952
Benchimol, R., 1952
Beyne, J., 1952
Dekking, H. M., 1952

VISUAL ACCOMMODATION
relation to age
Clements, R., 1952
relation to mental ability
Clements, R., 1952
tests
Whiteside, T. C. D., 1952

VISUAL ACUITY
effects of optical filters
Wilson, M. R., 1952

VISUAL FATIGUE
Brozek, J., 1952

Visual field see Prone position flight, field of vision

VISUAL FLIGHT
Edwards, T. M., 1952

VISUAL ILLUSIONS (Oculogravic illusion, Oculogyral illusion, Optical illusions)
Graybiel, A., 1952c
Lichte, W. H., 1952
Pollock, W. T., 1952
Schafer, G. E., 1952
Sleight, R. B., 1952
caused by acceleration
Clark, B., 1952
Graybiel, A., 1952a, 1952b
caused by rotation
Aschan, G., 1952
Clark, B., 1952b
Graybiel, A., 1952
Guedry, F. E., 1952, 1952a
Mann, C. W., 1952, 1952d
caused by subgravity
Gerathewohl, S. J., 1952

VISUAL PERCEPTION (see also Brightness discrimination; Depth perception; Flicker fusion frequency; Form perception; Visual fatigue; Visual illusions)
Anon., 1952ar
Brozek, J., 1952
Cibis, P. A., 1952d
Jaeger, W., 1952
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Weiner, J., 1952
effects of alcohol
Ferraris de Gaspare, P. F., 1952
effects of anoxia
Benchimol, R., 1952e
Ferraris de Gaspare, P. F., 1952
effects of high speed
Benchimol, R., 1952b
Sébas, R., 1952
effects of tobacco
Ferraris de Gaspare, P. F., 1952
in radar operation
Bowen, H. M., 1952
psychological factors
Bahrick, H. P., 1952
Fry, G. A., 1952
relation to spatial orientation
Boring, R. O., 1952
Gibson, J. J., 1952a
Mann, C. W., 1952a, 1952b, 1952c
Pollock, W. T., 1952
Thetford, P. E., 1952
relation to retinal adaptation
Brown, J. L., 1952, 1952a, 1952b
Brown, K. T., 1952
Diamond, A. L., 1952
Herrick, R. M., 1952
Verplanck, W. S., 1952
test methods
Fields, P. E., 1952

Vitamin B_1 see Thiamine
Voice see Speaking; Speech

VOMEX A, use in motion sickness
Rudat, W., 1952

WARNING DEVICES
Burr, H. S., 1952
Kramer, K., 1952
Spencer, J., 1952

WATER EXCHANGE through skin
Peiss, C. N., 1952

WATER SUPPLY, sanitation
Whittingham, H. E., 1952

WEATHER (see also Wind), effects on circulation
Deschwanden, J. von, 1952

WEIGHT (see also Body weight)
Haber, H., 1952e, 1952f

Weightlessness see Subgravity

WHOOPING COUGH (Pertussis), effects of airplane flight
Seabra, P., 1952
Villalonga, J., 1952

WIND, psychological effects
Beltran, L., 1952

WIND BLAST, tolerance
Savely, H. E., 1952

Work see Mental work; Physical exercise
Wounds see under Injuries

X-RAYS, physiological effects
Burnright, T. R., 1952
combined with altitude
Smith, W. W., 1952
combined with anoxia
Kimeldorf, D. J., 1952a
combined with cold
Kimeldorf, D. J., 1952, 1952b
combined with high temperature
Parr, W. H., 1952
on muscular system
Gerstner, H. B., 1952

Zero acceleration see Subgravity